Name:

Common Core Geometry

Unit 4

Similar Triangles

Mr. Schlansky

2025

Lesson 1: I can dilate shapes by counting the distance from the center to each point the amount of times as the scale factor.
Dilations (enlarge or shrink):

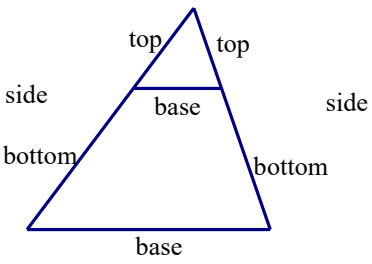
1) Count the distance from center of dilation to each point. Repeat that distance as many times as the scale factor.
2) If center of dilation is origin, multiply each coordinate by the scale factor.

Lesson 2: I can find a missing side of similar triangles by creating a proportion, cross multiplying, and solving.
To create a proportion, put the corresponding sides on top of each other.
When you have rotated (twisted) triangles, the corresponding sides are diagonal from each other.

Lesson 3: I can find a missing side of overlapping similar triangles by separating the triangles are creating a proportion.
1) Draw the triangle separately and make them look the same.
2) Put the corresponding angles in the same position using givens and/or reflexive property.
3) Create proportion and solve.

Lesson 4: I can find a missing side of a triangle when midpoints are joined using $2(midsegment) = opposite\ side$**.**
If the midpoints are joined: 2(midsegment) = opposite parallel side

Lesson 5: I can solve candy corn problems by separating the triangles (bases) or $\frac{top}{top} = \frac{side}{side} = \frac{bottom}{bottom}$ **(no bases).**
Candy Corn Problems:
If the bases are not involved: $\frac{top}{top} = \frac{bottom}{bottom} = \frac{side}{side}$
If bases are involved: separate your triangles!



Lesson 6: I can reduce radicals by finding the largest perfect square that divides into it.

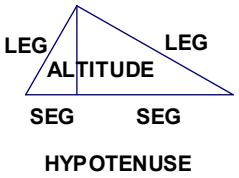
Reducing Radicals

1) Separate into two radicals (perfect squares and non perfect squares). Find the largest perfect square that divides in
2) Take the square root of the perfect square. Bring the non-perfect square down

Lesson 7: I can solve altitude drawn to right triangle problems using HLLS and SAAS.

When an altitude is drawn to a right triangle:

HLLS and SAAS



$\frac{H}{L}=\frac{L}{S}$ $\frac{S}{A}=\frac{A}{S}$

If L is involved, use HLLS

If A is involved, use SAAS

If both are involved, use both!

Lesson 8: I can solve quadratic equations by factoring trinomials

Solving Quadratic Equations

1) Bring everything to one side
2) Factor
    a. First sign comes down
    b. Multiply signs for the second sign
    c. Find two numbers that multiply to the last number and add/subtract to the middle number
3) Set each factor equal to zero

Lesson 9: I can solve similar triangle problems involving quadratics using similar triangle rules and by factoring.

Follow notes from:

Lesson 2

Lesson 5

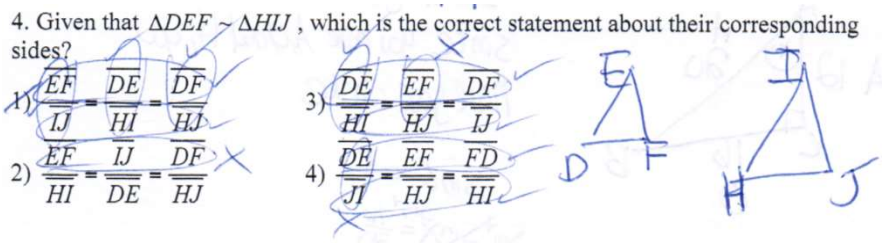
Lesson 7

Lesson 8

*Reject any value that makes a side negative/zero.

Lesson 10: I can determine if triangles are similar using AA, SAS, and SSS.
To show triangles are similar:
1) AA (2 pairs of corresponding angles are congruent)
2) SAS (2 pairs of corresponding sides are in proportion and the corresponding angles between them are congruent)
3) SSS (3 pairs of corresponding sides are in proportion)
Show the sides are in proportion by creating a proportion

Lesson 11: I can determine if a proportion is true by circling horizontally and vertically and seeing if the parts correspond or are in the same triangle.
To determine if a proportion is correct, circle horizontally and vertically. One direction the sides should correspond, the other should be in the same triangle.
DRAW YOUR OWN TRIANGLES EVEN IF THEY GIVE YOU TRIANGLES



Lesson 12: I can determine if a HLLS SAAS/Candy Corn proportion is true by seeing if the proportion fit into HLLS SAAS, $\frac{top}{top} = \frac{bottom}{bottom} = \frac{side}{side}$, or separating the triangles and circling.

Candy Corn Problems:
Have a picture of the original problem and the triangles separated.
If bases are not involved, see if it satisfies $\frac{top}{top} = \frac{bottom}{bottom} = \frac{side}{side}$
If bases are involved, separate the triangles and follow the same procedure from previous lesson.

HLLS SAAS Problems:
See if each proportion satisfies $\frac{H}{L_1} = \frac{L_1}{S}$ or $\frac{S}{A} = \frac{A}{S}$.
*For HLLS, make sure if you're using the left leg you're using the left segment.

Lesson 13: I can find the scale factor of a dilation using $\frac{image}{original}$.

Scale factor = $\frac{image}{original}$
*Make sure the sides that you're using correspond (same position).

Lesson 14: I can find the ratio of the perimeters and the areas using scale factor = scale factor of perimeters and $(Scale\ Factor)^2$ scale factor of areas.

Multiply the original perimeter and scale factor to find the image perimeter.

Multiply the original area and the $(scale\ factor)^2$ to find the image area.

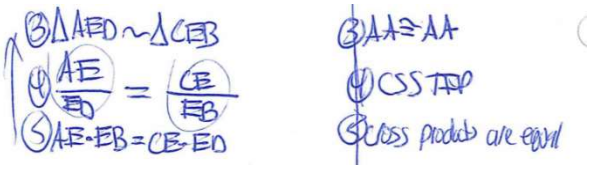
The corresponding angles are always the same (ratio of 1:1).

Lesson 15-17: I can prove triangles are similar using AA. I can prove multiplication by working backwards and proving triangles are similar.

To prove triangles are SIMILAR, prove AA

If asked to prove a proportion/multiplication:

1) Prove triangles are similar
2) Corresponding Sides of Similar Triangle are In Proportion (CSSTIP)
3) Cross Products are Equal



Work Backwards!

To work backwards:

1) Put the segments being multiplied diagonal from each other in a proportion.
2) Look at the letters in the proportion horizontally and vertically. Whichever direction has letters that make a triangle, those are your triangles to prove similar.
3) Prove triangles are similar using

1) Do a mini proof with your givens

Altitude creates two congruent right angles
Angle bisector creates two congruent angles
Perpendicular lines create two congruent right angles
Parallel lines cut by a transversal create
Congruent corresponding angles (1 in, 1 out) OR congruent alternate interior angles (2 out) OR
congruent alternate exterior angles (2 out)
*Perpendicular bisector is perpendicular and line bisector (1 pair of congruent right angles, 1 pair of congruent segs)
*If segments bisect each other, they are both cut in half (2 pairs of congruent segments)

2) Use additional tools:

Vertical Angles are congruent (Look for an X)
Reflexive Property (A side/angle is in both triangles and is congruent to itself)
Isosceles Triangles (In a triangle, congruent angles are opposite congruent sides)

Lesson 18: I can prepare for my similar triangles test by practicing!

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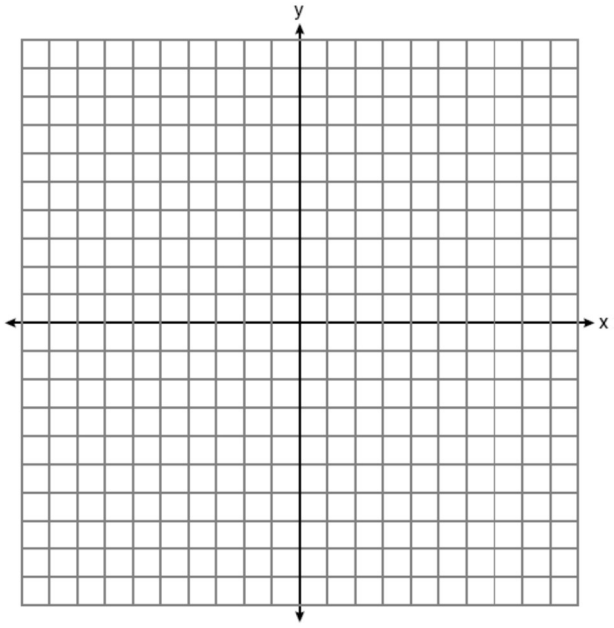
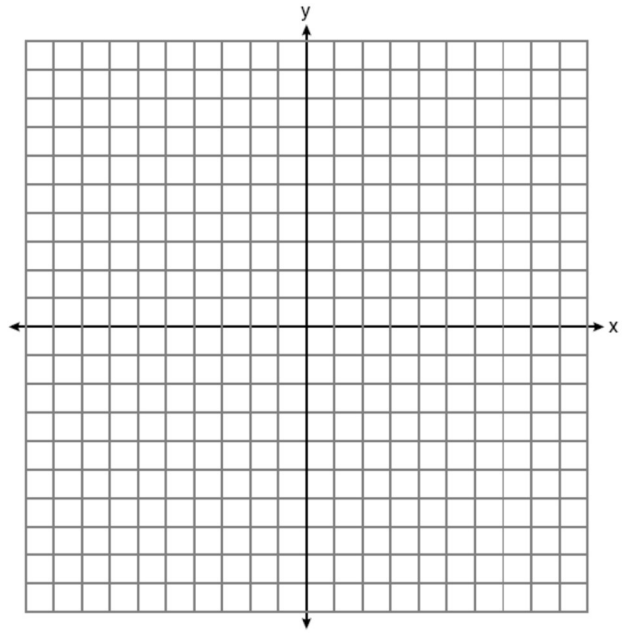
Mr. Schlansky Geometry

Dilations

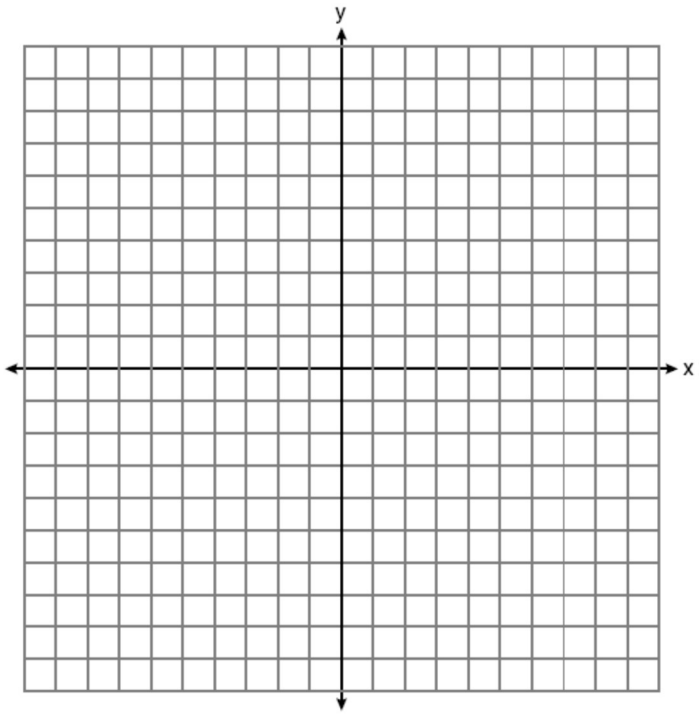
1. Triangle *SUN* has coordinates *S*(0,4), *U*(3,5), and *N*(3,0). On the accompanying grid, draw and label $\triangle SUN$. Then, graph and state the coordinates of $\triangle S'U'N'$, the image of $\triangle SUN$ after a dilation of 2 centered at the origin.



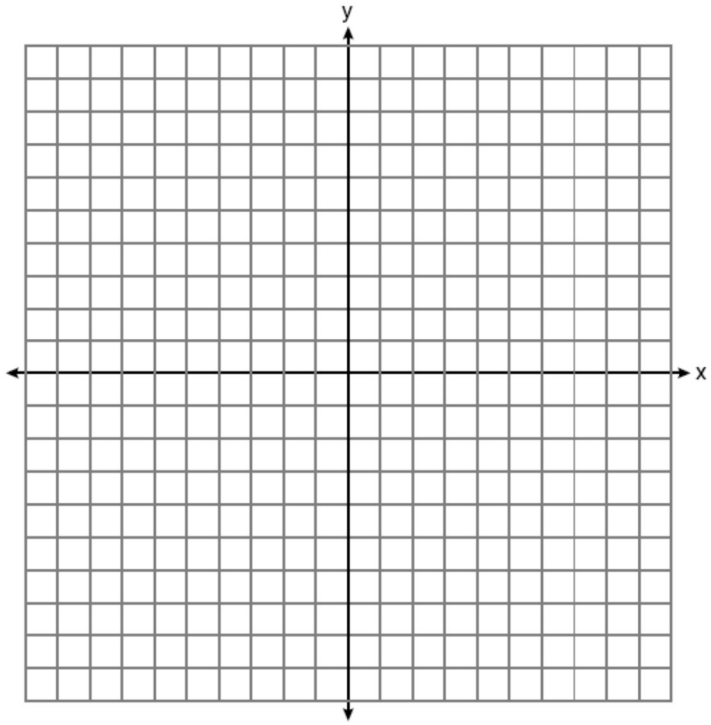
2. Triangle *SUN* has coordinates *S*(0,4), *U*(3,5), and *N*(3,0). On the accompanying grid, draw and label $\triangle SUN$. Then, graph and state the coordinates of $\triangle S'U'N'$, the image of $\triangle SUN$ after a dilation of 2 centered at (-1,4).



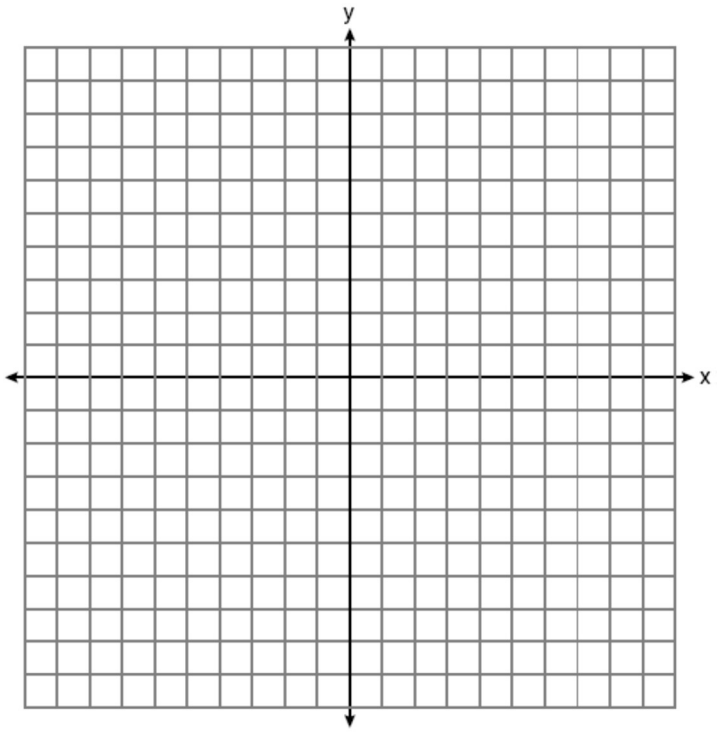
3. Triangle ABC has coordinates $A(2,1)$, $B(6,1)$, $C(5,3)$. What is the image of this triangle after a dilation of 4 centered at (6,4). Graph both the image and the pre image.



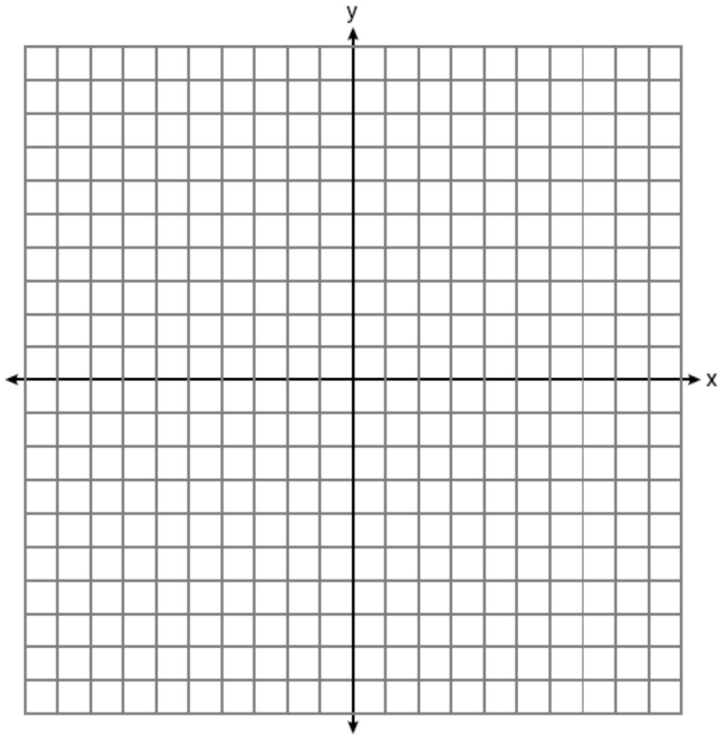
4. The coordinates of the vertices of $\triangle RST$ are $R(-2,3)$, $S(4,4)$, and $T(2,-2)$. Graph $\triangle RST$ and $\triangle R'S'T'$, the image of $\triangle RST$ after a dilation of 3 centered at (1,2).



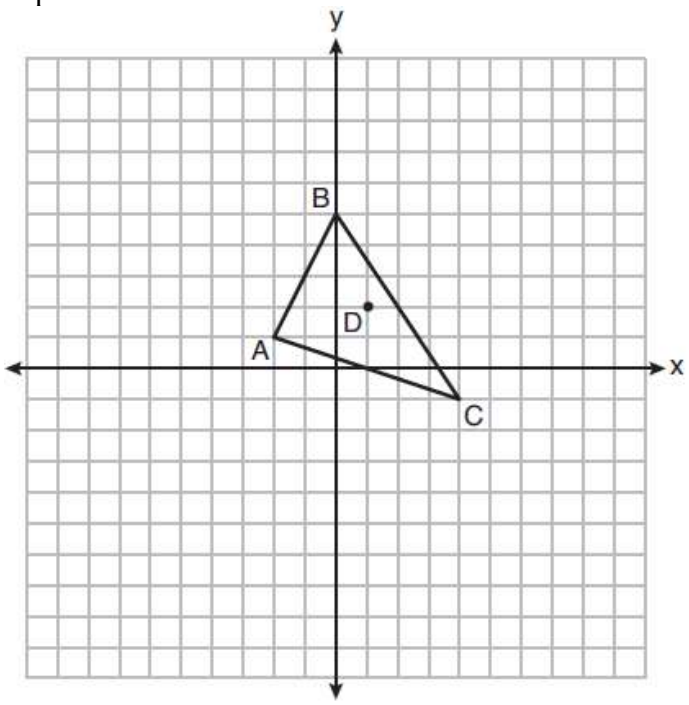
5. Triangle SBR has coordinates $S(-2,3)$, $B(-1,-2)$, and $R(3,-3)$. What is the image of this triangle after a dilation with a scale factor of 3 centered at the origin. Graph both the image and the pre image.



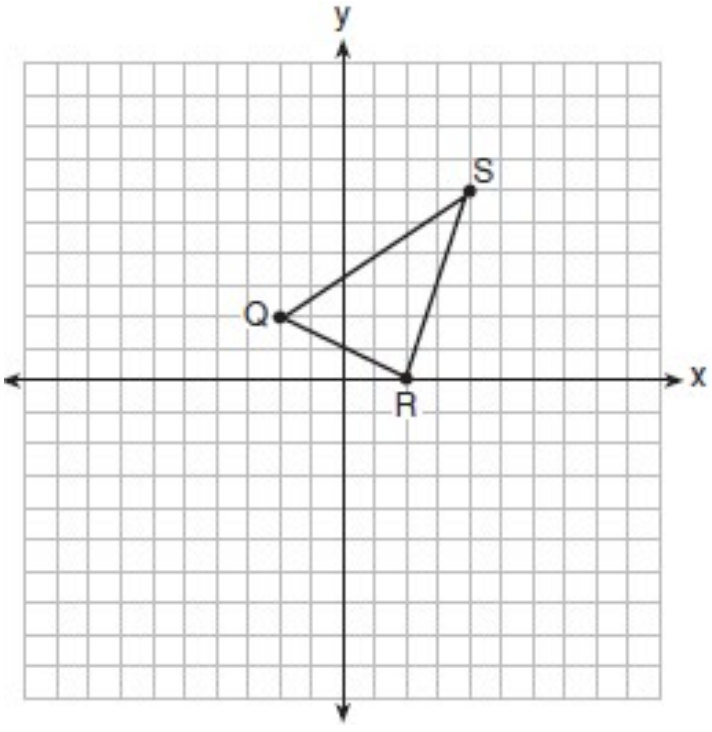
6. The coordinates of the vertices of ΔJKL are $J(5,-2)$, $K(6,1)$, and $L(-1,0)$. Graph ΔJKL. Graph and label $\Delta J'K'L'$, the image of ΔJKL after a dilation of 2 centered at J.



7. Triangle ABC and point $D(1, 2)$ are graphed on the set of axes below.
Graph and label $\triangle A'B'C'$, the image of $\triangle ABC$, after a dilation of scale factor 2 centered at point D.



8. Triangle QRS is graphed on the set of axes below.
On the same set of axes, graph and label $\triangle Q'R'S'$, the image of $\triangle QRS$ after a dilation with a scale factor of $\frac{3}{2}$ centered at the origin.



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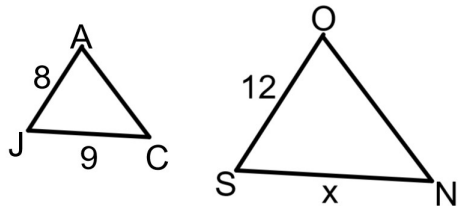
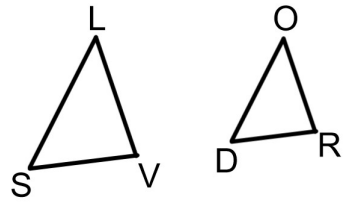
Finding Missing Sides of Similar Triangles

1. In the diagram, ΔJAC is similar to ΔSON. Find the measure of *SN*.

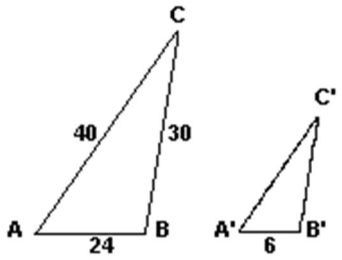


2. In the diagram, ΔSLV is similar to ΔDOR. If *SV=24*, *DR=16*, *LV=21,* find *OR*.

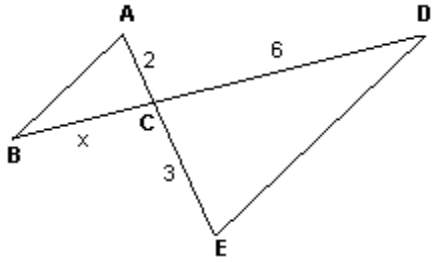


3. Triangle *HON* is similar to triangle *DUR*. If *HO=12, DU=24, UR=18*, find *ON*.

4. In the diagram, ΔABC is similar to $\Delta A'B'C'$, *AB* = 24, *BC* = 30, and *CA* = 40. If the shortest side of $\Delta A'B'C'$ is 6, find the length of the longest side of $\Delta A'B'C'$.

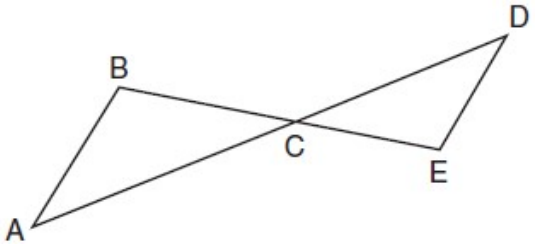


5. In the diagram below, $\overline{AB} \parallel \overline{DE}$. If $AC = 2$, $CD = 6$, and $CE = 3$, what is BC?

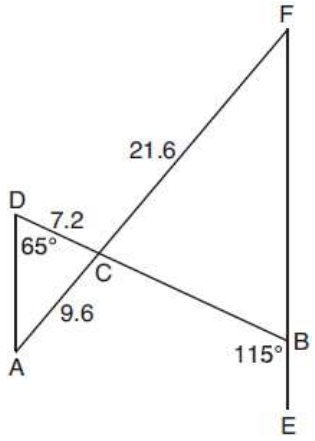


6. In the diagram below, $\overline{AD}$ intersects $\overline{BE}$ at C, and $\overline{AB} \parallel \overline{DE}$.

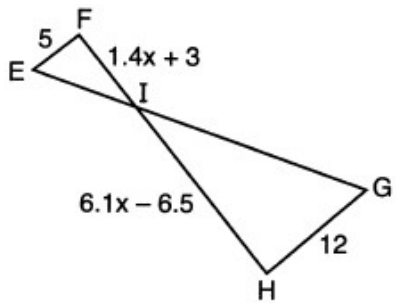
If $CD = 6.6$ cm, $DE = 3.4$ cm, $CE = 4.2$ cm, and $BC = 5.25$ cm, what is the length of $\overline{AC}$, to the *nearest hundredth of a centimeter*?



7. In the diagram below, $\overline{AF}$, and $\overline{DB}$ intersect at C, and $\overline{AD}$ and $\overline{FBE}$ are drawn such that $m\angle D = 65°$, $m\angle CBE = 115°$, $DC = 7.2$, $AC = 9.6$, and $FC = 21.6$. What is the length of $\overline{CB}$?



8. In the diagram below, $\overline{EF} \parallel \overline{HG}$, $EF = 5$, $HG = 12$, $FI = 1.4x + 3$, and $HI = 6.1x - 6.5$. What is the length of $\overline{HI}$?



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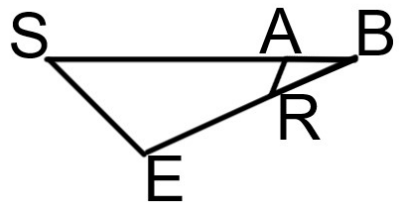
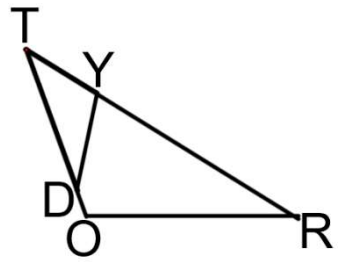
Overlapping Similar Triangles

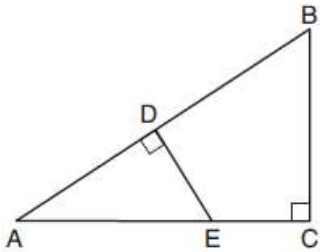
1. In triangle *SEB*, *A* is on $\overline{SB}$, and *E* is on $\overline{EB}$ so that $\angle E \cong \angle BAR$.
If $\overline{SB} = 6$, $\overline{RB} = 2$, and $\overline{SE} = 3$, find $\overline{RA}$.



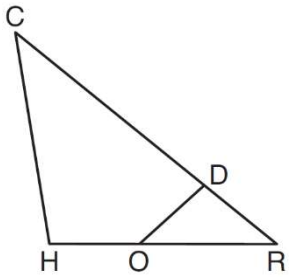
2. In triangle *TOR*, *Y* is on $\overline{TR}$, and *D* is on $\overline{TO}$ so that $\angle TYD \cong \angle ROT$.
If $\overline{TY} = 2$, $\overline{YR} = 6$, and $\overline{TD} = 4$, find $\overline{TO}$.



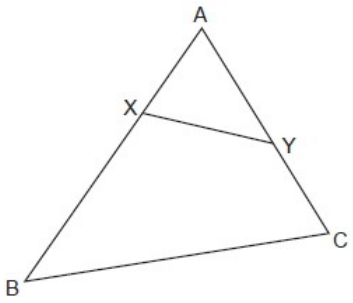
3. In $\triangle ABC$ shown below, $\angle ACB$ is a right angle, *E* is a point on $\overline{AC}$, and $\overline{ED}$ is drawn perpendicular to hypotenuse $\overline{AB}$. If $AB = 9$, $BC = 6$, and $DE = 4$, what is the length of $\overline{AE}$?



4. In triangle CHR, O is on $\overline{HR}$, and D is on $\overline{CR}$ so that $\angle H \cong RDO$. If $RD = 4$, $RO = 6$, and $OH = 4$, what is the length of $\overline{CD}$?

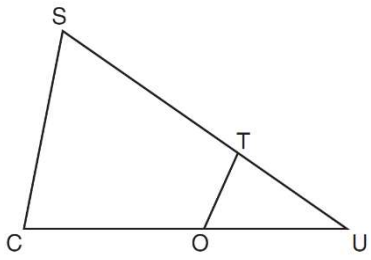


5. In the diagram below of $\triangle ABC$, X and Y are points on $\overline{AB}$ and $\overline{AC}$, respectively, such that $m\angle AYX = m\angle B$. If $\overline{AX} = 2$, $\overline{AY} = 5$, and $\overline{YC} = 4$, find $\overline{BX}$.



6. In $\triangle SCU$ shown below, points T and O are on $\overline{SU}$ and $\overline{CU}$, respectively. Segment OT is drawn so that $\angle C \cong \angle OTU$.

If $TU = 4$, $OU = 5$, and $OC = 7$, what is the length of $\overline{ST}$?



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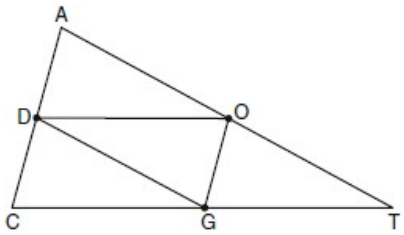
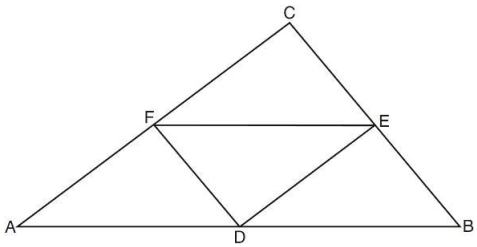
Joining Midpoints of a Triangle

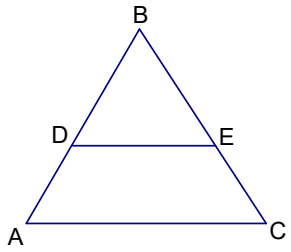
1. In the diagram below of $\triangle ACT$, D is the midpoint of $\overline{AC}$, O is the midpoint of $\overline{AT}$, and G is the midpoint of $\overline{CT}$. If $AC = 10$, $AT = 18$, and $CT = 22$, what is the perimeter of parallelogram $CDOG$?



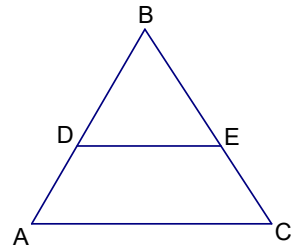
2. In the diagram of $\triangle ABC$ shown below, D is the midpoint of $\overline{AB}$, E is the midpoint of $\overline{BC}$, and F is the midpoint of $\overline{AC}$. If $AB = 20$, $BC = 12$, and $AC = 16$, what is the perimeter of trapezoid $ABEF$?



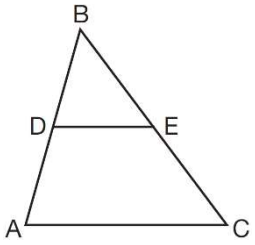
3. D and E are midpoints of $\overline{AB}$ and $\overline{BC}$ respectively. If $\overline{AC} = x + 15$ and $\overline{DE} = x - 3$, find the measure of $\overline{DE}$.



4. D and E are midpoints of $\overline{AB}$ and $\overline{BC}$ respectively. If $\overline{DE} = 2x + 5$ and $\overline{AC} = 7x + 1$, find the measure of $\overline{AC}$.



5. In $\triangle ABC$, D is the midpoint of $\overline{AB}$ and E is the midpoint of $\overline{BC}$. If $AC = 3x - 15$ and $DE = 6$, what is the value of x?



1) 6
2) 7
3) 9
4) 12

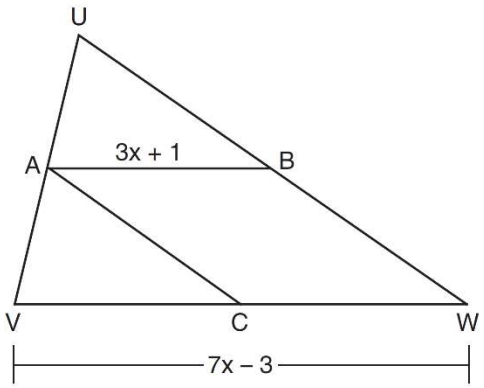
6. In $\triangle ABC$, M is the midpoint of $\overline{AB}$ and N is the midpoint of $\overline{AC}$. If $MN = x + 13$ and $BC = 5x - 1$, what is the length of $\overline{MN}$?

1) 3.5
2) 9
3) 16.5
4) 22

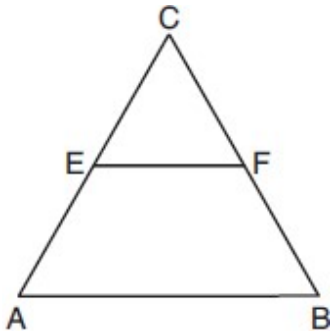
7. In the diagram of $\triangle UVW$ below, A is the midpoint of $\overline{UV}$, B is the midpoint of $\overline{UW}$, C is the midpoint of $\overline{VW}$, and $\overline{AB}$ and $\overline{AC}$ are drawn.

If $VW = 7x - 3$ and $AB = 3x + 1$, what is the length of $\overline{VC}$?

1) 5
2) 13
3) 16
4) 32



8. In the diagram of equilateral triangle ABC shown below, E and F are the midpoints of $\overline{AC}$ and $\overline{BC}$, respectively.
If $EF = 2x + 8$ and $AB = 7x - 2$, what is the perimeter of trapezoid $ABFE$?



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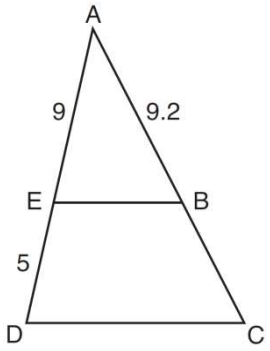
Candy Corn Problems

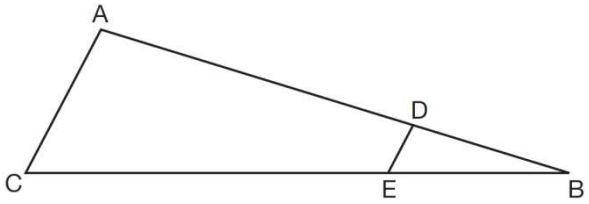
1. In the diagram of ΔADC below, $\overline{EB} \parallel \overline{DC}$, $AE = 9$, $ED = 5$, and $AB = 9.2$.

What is the length of $\overline{AC}$, to the *nearest tenth*?

1) 5.1
2) 5.2
3) 14.3
4) 14.4



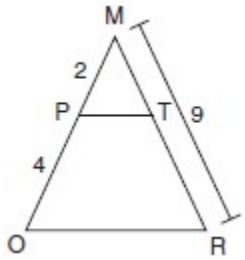
2. In the diagram of $\triangle ABC$, points *D* and *E* are on $\overline{AB}$ and $\overline{CB}$, respectively, such that $\overline{AC} \parallel \overline{DE}$.



If $AD = 24$, $DB = 12$, and $DE = 4$, what is the length of $\overline{AC}$?

1) 8
2) 12
3) 16
4) 72

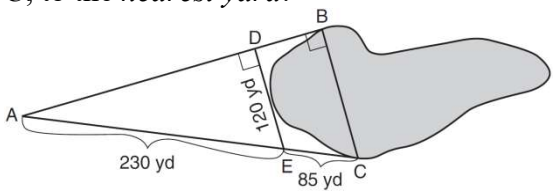
3. Given $\triangle MRO$ shown below, with trapezoid *PTRO*, $MR = 9$, $MP = 2$, and $PO = 4$.



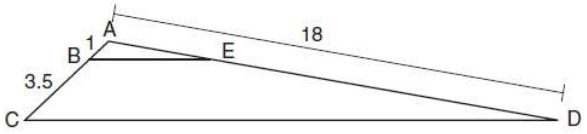
What is the length of $\overline{TR}$?

1) 4.5
2) 5
3) 3
4) 6

4. To find the distance across a pond from point *B* to point *C*, a surveyor drew the diagram below. The measurements he made are indicated on his diagram.
Use the surveyor's information to determine and state the distance from point *B* to point *C*, to the *nearest yard*.

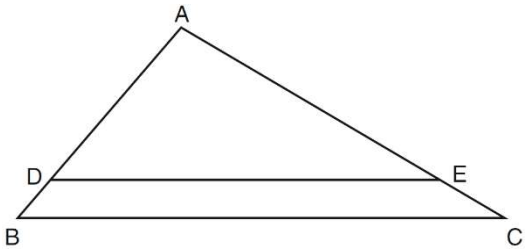


5. In the diagram below, triangle *ACD* has points *B* and *E* on sides $\overline{AC}$ and $\overline{AD}$, respectively, such that $\overline{BE} \parallel \overline{CD}$, $AB = 1$, $BC = 3.5$, and $AD = 18$.

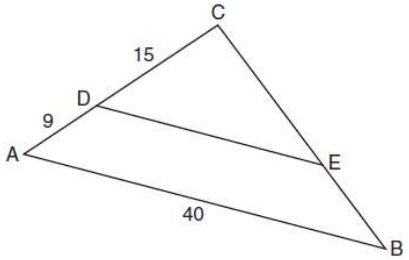


What is the length of $\overline{AE}$, to the *nearest tenth*?

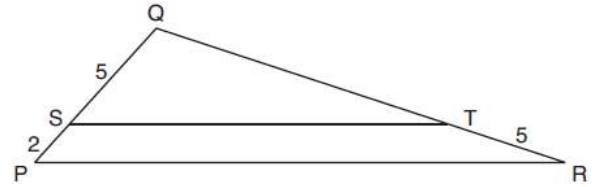
6. In the diagram of $\triangle ABC$ shown below, $\overline{DE} \parallel \overline{BC}$.
If $\overline{AE} = 6$, $\overline{DE} = 10$, and $\overline{AC} = 9$, find $\overline{BC}$



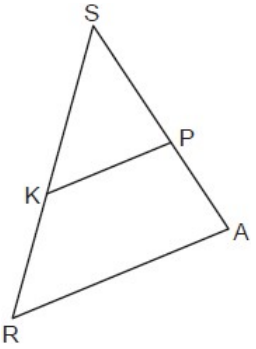
7. In the diagram of $\triangle ABC$ below, $\overline{DE}$ is parallel to $\overline{AB}$, $CD = 15$, $AD = 9$, and $AB = 40$.
Find the length of $\overline{DE}$.



8. In the diagram below of $\triangle PQR$, $\overline{ST}$ is drawn parallel to $\overline{PR}$, $PS = 2$, $SQ = 5$, and $TR = 5$
What is the length of $\overline{QR}$?



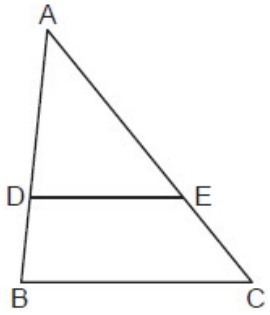
9. In the diagram of $\triangle SRA$ below, $\overline{KP}$ is drawn such that $\angle SKP \cong \angle SRA$.



If $SK = 10$, $SP = 8$, and $PA = 6$, what is the length of $\overline{KR}$, to the *nearest tenth*?

1) 4.8
2) 7.5
3) 8.0
4) 13.3

10. In triangle ABC below, D is a point on $\overline{AB}$ and E is a point on $\overline{AC}$, such that $\overline{DE} \parallel \overline{BC}$.



If $AD = 12$, $DB = 8$, and $EC = 10$, what is the length of $\overline{AC}$?

1) 15
2) 22
3) 24
4) 25

11. In $\triangle ABC$, point D is on $\overline{AB}$, and point E is on $\overline{BC}$ such that $\overline{DE} \parallel \overline{AC}$. If $DB = 2$, $DA = 7$, and $DE = 3$, what is the length of $\overline{AC}$?

12. In triangle ABC, M is a point on $\overline{AC}$ and N is a point on $\overline{CB}$ such that $\overline{MN} \parallel \overline{AB}$ If $\overline{AC} = 8$, $\overline{AB} = 12$, and $\overline{CM} = 6$. Find the length of $\overline{MN}$

Name _____ Date _____
Mr. Schlansky Geometry

Reducing Radicals

Reducing Radicals

-Separate into two radicals (perfect squares and non perfect squares). Find the largest perfect square that divides in

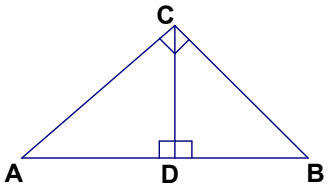
-Take the square root of the perfect square. Bring the non-perfect square down

1. $\sqrt{45}$
2. $\sqrt{50}$
3. $\sqrt{162}$
4. $\sqrt{32}$
5. $\sqrt{48}$
6. $\sqrt{75}$
7. $\sqrt{48}$
8. $\sqrt{200}$
9. $\sqrt{98}$
10. $\sqrt{125}$
11. $\sqrt{147}$
12. $\sqrt{192}$

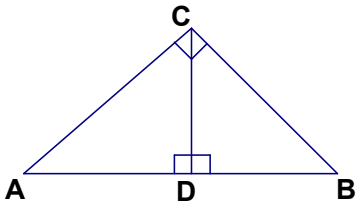
Name _____ Date _____
Mr. Schlansky Geometry

Altitude Drawn to a Right Triangle

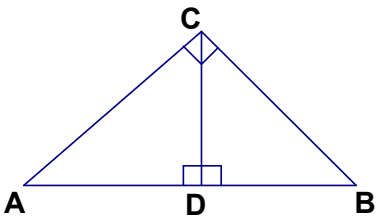
1. If $\overline{AD} = 3$ and $\overline{CD} = 6$, find $\overline{DB}$



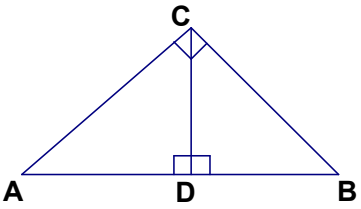
2. If $\overline{AC} = 10$ and $\overline{AD} = 5$, find $\overline{AB}$



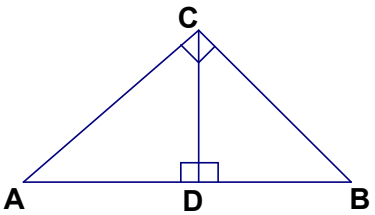
3. If $\overline{AC} = 6$ and $\overline{AB} = 9$, find $\overline{AD}$



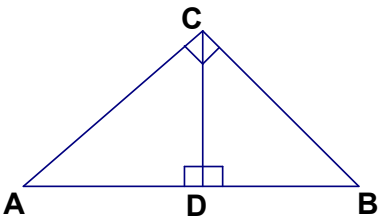
4. If $\overline{DB} = 4$ and $\overline{BC} = 10$, find $\overline{AB}$



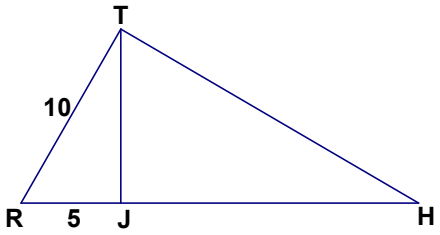
5. If $\overline{AD} = 3$ and $\overline{DB} = 27$, find $\overline{CD}$



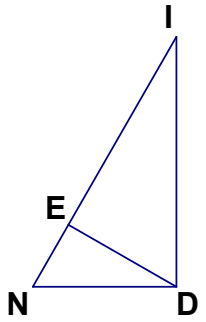
6. If $\overline{AD} = 2$ and $\overline{AB} = 18$, find $\overline{BC}$ to the nearest tenth



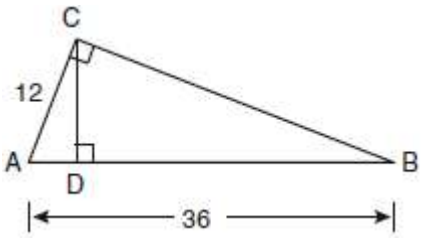
7. Altitude $\overline{TJ}$ is drawn to right triangle RTH. What is the measure of $\overline{RH}$?



8. In the diagram below, $\overline{DE}$ is an altitude drawn to right triangle NDI. If $\overline{IN} = 10$, and $\overline{DN} = 5$, find $\overline{EN}$.



9. In the diagram below of right triangle ACB, altitude $\overline{CD}$ is drawn to hypotenuse $\overline{AB}$. If $AB = 36$ and $AC = 12$, what is the length of $\overline{AD}$?



10. In right triangle ABC, altitude $\overline{CD}$ is drawn to hypotenuse $\overline{AB}$.
If $AD = 3$ and $DB = 12$, what is the length of altitude $\overline{CD}$?

1) 6
2) $6\sqrt{5}$
3) 3
4) $3\sqrt{5}$

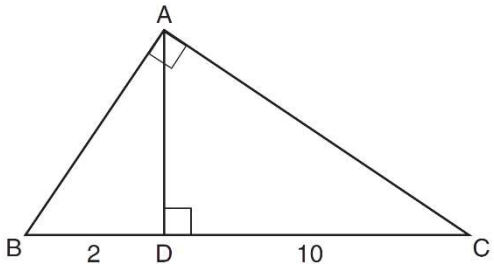
11. Line segment CD is the altitude drawn to hypotenuse $\overline{EF}$ in right triangle ECF. If $EC = 10$ and $EF = 24$, then, to the *nearest tenth*, ED is

1) 4.2
2) 5.4
3) 15.5
4) 21.8

12. Triangle ABC shown below is a right triangle with altitude $\overline{AD}$ drawn to the hypotenuse $\overline{BC}$.

If $BD = 2$ and $DC = 10$, what is the length of $\overline{AB}$?

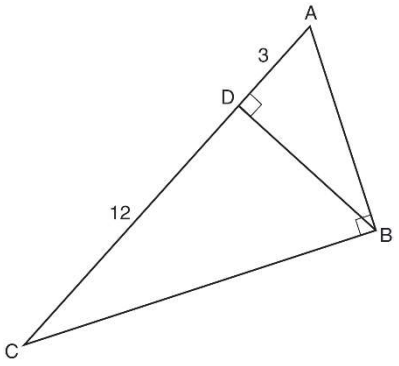
1) $2\sqrt{2}$
2) $2\sqrt{5}$
3) $2\sqrt{6}$
4) $2\sqrt{30}$



13. In right triangle ABC shown in the diagram below, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$, $CD = 12$, and $AD = 3$.

What is the length of $\overline{AB}$?

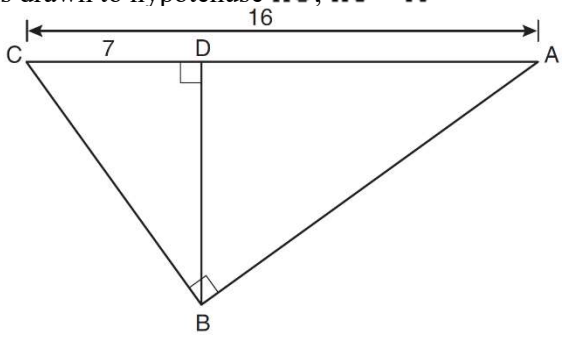
1) $5\sqrt{3}$
2) 6
3) $3\sqrt{5}$
4) 9



14. In the diagram below of right triangle ABC, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$, $AC = 16$, and $CD = 7$.

What is the length of $\overline{BD}$?

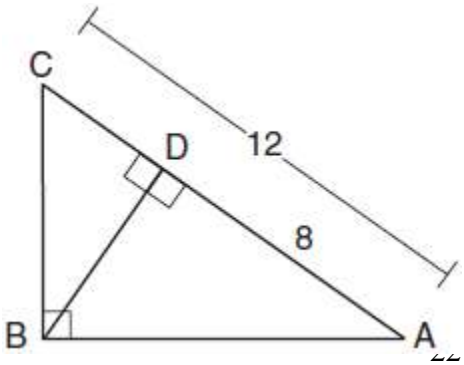
1) $3\sqrt{7}$
2) $4\sqrt{7}$
3) $7\sqrt{3}$
4) 12



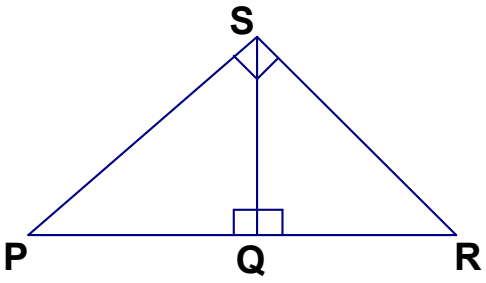
15. In the diagram below of $\triangle ABC$, $\angle ABC$ is a right angle, $AC = 12$, $AD = 8$, and altitude $\overline{BD}$ is drawn.

What is the length of $\overline{BC}$?

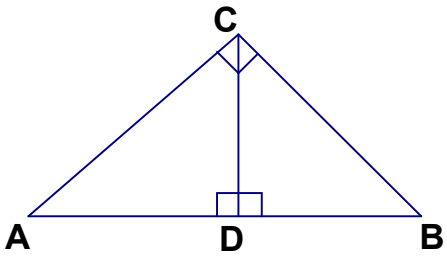
1) $4\sqrt{2}$
2) $4\sqrt{3}$
3) $4\sqrt{5}$
4) $4\sqrt{6}$



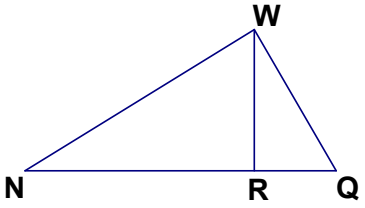
16. Altitude $\overline{SQ}$ is drawn to right triangle PSR. If $\overline{PQ}$ = 12 and $\overline{QR}$ is 3 less than $\overline{SQ}$, find the length of $\overline{QR}$.



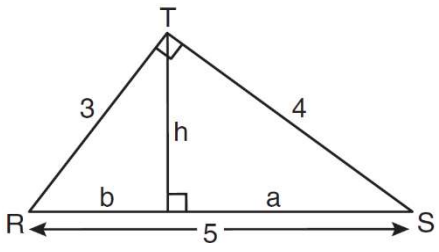
17. Altitude $\overline{CD}$ is drawn to right triangle ABC. The measure of $\overline{DB}$ is 9 less than $\overline{DA}$. If the altitude is 6, find the measure of $\overline{AD}$.



18. Altitude $\overline{WR}$ is drawn to right triangle NWQ. If $\overline{QW}$ = 8 and $\overline{NQ}$ = 16, find $\overline{WR}$ to the nearest tenth.



19. In the diagram below, $\triangle RST$ is a $3-4-5$ right triangle. The altitude, *h*, to the hypotenuse has been drawn. Determine the length of *h*.



Name _____ Date _____
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Factoring Trinomials and Solving Quadratic Equations

Factor the following trinomials

1. $x^2 + 4x - 12$

2. $x^2 + 3x + 2$

3. $x^2 - 8x + 15$

4. $x^2 - 8x - 20$

5. $x^2 + 5x - 14$

6. $x^2 + x - 12$

7. $x^2 - 3x - 10$

8. $x^2 - 7x + 12$

9. $x^2 - 9x + 20$

10. $x^2 - 9x - 36$

Solve the following equations for x:

11. $x^2 - 5x = 6$

12. $x^2 + 4x = 45$

13. $x^2 = 3x + 18$

14. $x^2 = 8x + 33$

15. $x^2 - 7x = 3x - 16$

16. $x^2 + 5x = 8x + 10$

17. $x(x-2) = 3(x+8)$

18. $x(x+7) = 3(x+7)$

19. $(x-2)(x+3) = 3x + 2$

20. $(x+3)(x+3) = 36$

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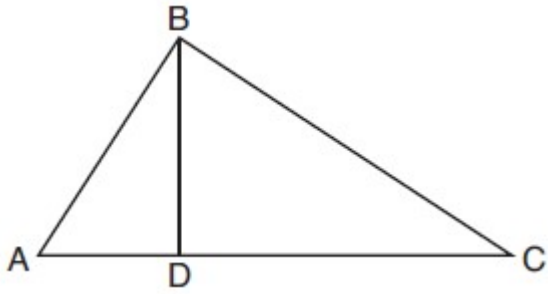
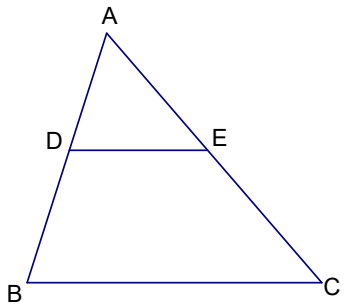
Similar Triangles with Quadratics

1. In the diagram below of right triangle ABC, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$. If $BD = 4$, $AD = x - 6$, and $CD = x$, what is the length of $\overline{CD}$?

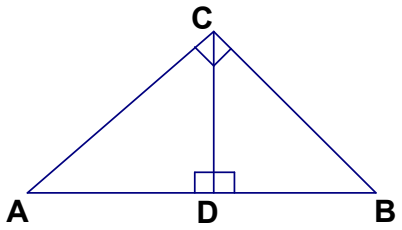


2. In triangle ABC, $\overline{DE} \parallel \overline{BC}$. If $\overline{AD} = 2$, $\overline{DB} = x + 1$, $\overline{AE} = x$, and $\overline{EC} = x + 6$, find $\overline{AE}$

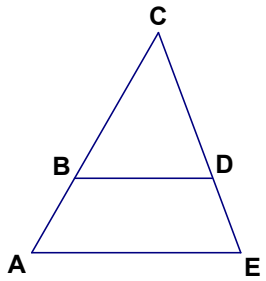


3. $\Delta HAI \sim \Delta CRE$. If $\overline{HA} = x$, $\overline{CR} = 6$, $\overline{HI} = 8$, and $\overline{CE} = x + 8$, determine and state the length of $\overline{CE}$.

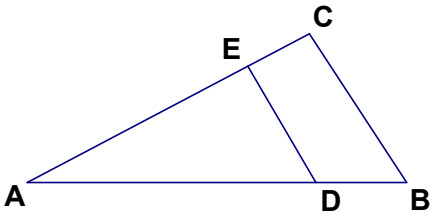
4. Altitude $\overline{CD}$ is drawn to right triangle ABC. If $\overline{AC} = 8$, $\overline{AB}$ = x, and $\overline{AD}$ = x – 12. Find the measure of $\overline{AD}$.



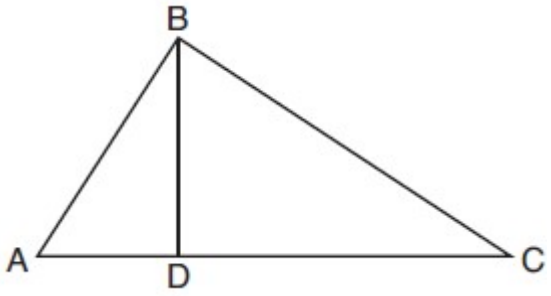
5. In the diagram, $\overline{BD} \parallel \overline{AE}$, $\overline{CB} = x + 3$, $\overline{BA} = 2$, $\overline{CD} = 2$, and $\overline{DE}$ = x. Find $\overline{DE}$.



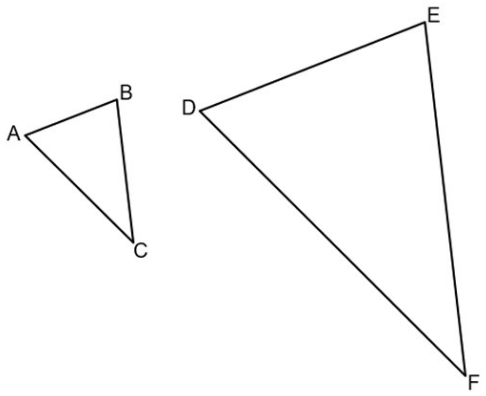
6. In the diagram, $\overline{ED} \parallel \overline{BC}$, $\overline{AE} = x + 2$, $\overline{DB} = x - 1$, $\overline{AD}$ = 9 and $\overline{EC}$ = 2, find the measure of $\overline{AE}$.



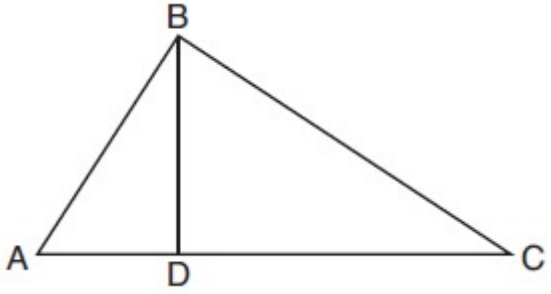
7. In the diagram, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$. If $\overline{AB} = x - 1$, $\overline{DC} = 5$ and $\overline{AD} = 4$, find $\overline{AB}$.



8. In the diagram below, $\Delta ABC \sim DEF$. If $\overline{AB} = 4$, $\overline{BC} = x - 1$, $\overline{DE} = x + 3$, and $\overline{EF} = 15$, determine and state the length of $\overline{DE}$.



9. In the diagram, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$. If $\overline{BD} = x + 2$, $\overline{DC} = 8$ and $\overline{AD} = 2$, find $\overline{BD}$.



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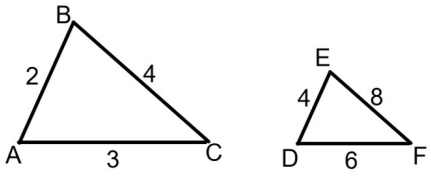
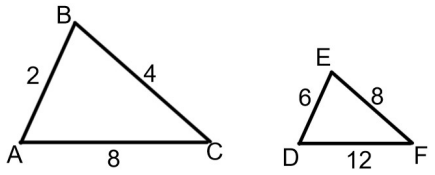
Determining Whether Triangles are Similar

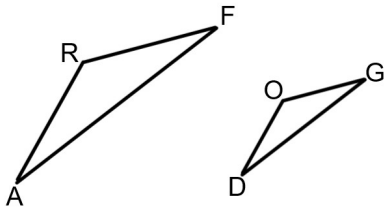
1. Determine whether the following triangles are similar. Explain your answer.



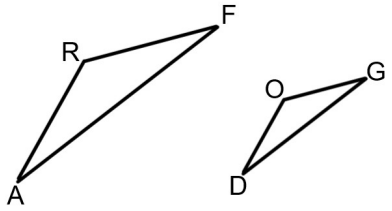
2. Determine whether the following triangles are similar. Explain your answer.



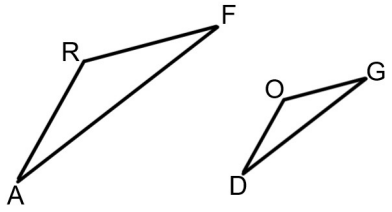
3. In the diagram below, $\overline{AR} = 15$, $\overline{RF} = 12$, $\overline{DO} = 10$, $\overline{OG} = 8$, and $\angle ARF \cong \angle DOG$. Must $\Delta ARF \sim \Delta DOG$? Explain your answer.



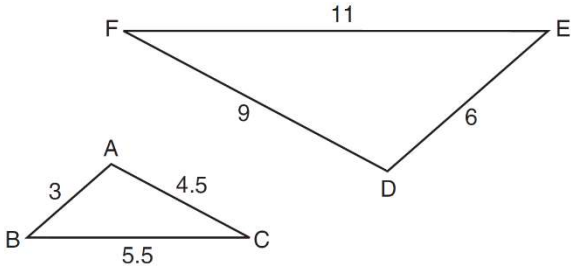
4. In the diagram below, $\overline{AR} = 18$, $\overline{RF} = 15$, $\overline{DO} = 12$, $\overline{OG} = 10$, and $\angle RAF \cong \angle ODG$. Must $\Delta ARF \sim \Delta DOG$? Explain your answer.



5. In the diagram below, $\overline{AF} = 20$, $\overline{RF} = 12$, $\overline{DG} = 12$, $\overline{OG} = 4$, and $\angle F \cong \angle G$. Must $\Delta ARF \sim \Delta DOG$? Explain your answer.



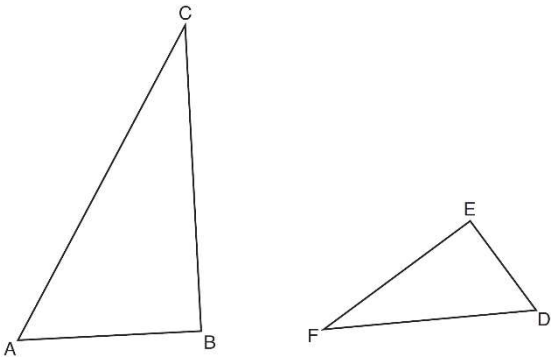
6. In the diagram below, $\triangle DEF$ is the image of $\triangle ABC$ after a clockwise rotation of 180° and a dilation where $AB = 3$, $BC = 5.5$, $AC = 4.5$, $DE = 6$, $FD = 9$, and $EF = 11$.



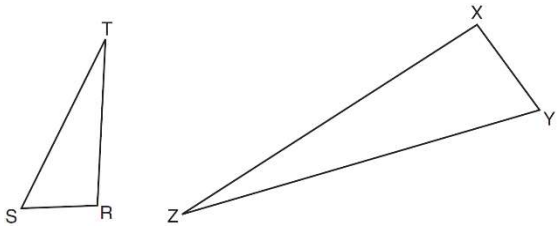
Show that $\Delta ABC \sim \Delta DEF$

7. Triangles *ABC* and *DEF* are drawn below.

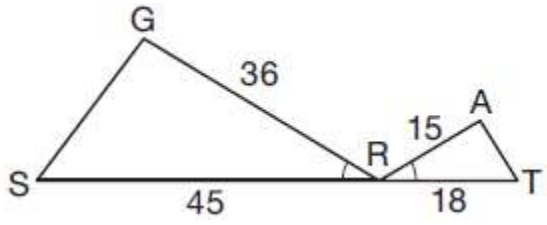
If $AB = 9$, $BC = 15$, $DE = 6$, $EF = 10$, and $\angle B \cong \angle E$, are the triangles similar? Explain your answer.



8. Triangles *RST* and *XYZ* are drawn below. If $RS = 6$, $ST = 14$, $XY = 9$, $YZ = 21$, and $\angle S \cong \angle Y$, is $\triangle RST$ similar to $\triangle XYZ$? Justify your answer.



9. In the diagram below, $\angle GRS \cong \angle ART$, $GR = 36$, $SR = 45$, $AR = 15$, and $RT = 18$.

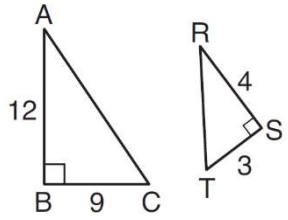


Which triangle similarity statement is correct?

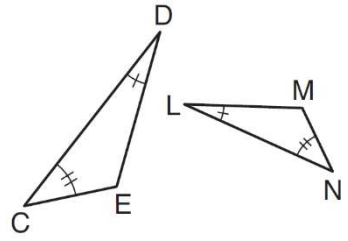
1) $\triangle GRS \sim \triangle ART$ by AA.
2) $\triangle GRS \sim \triangle ART$ by SAS.
3) $\triangle GRS \sim \triangle ART$ by SSS.
4) $\triangle GRS$ is not similar to $\triangle ART$.

10. Using the information given below, which set of triangles can *not* be proven similar?

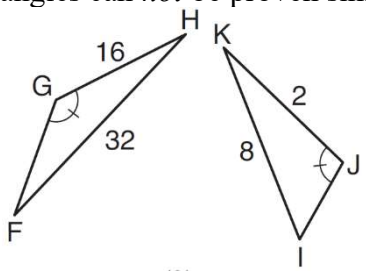
1)



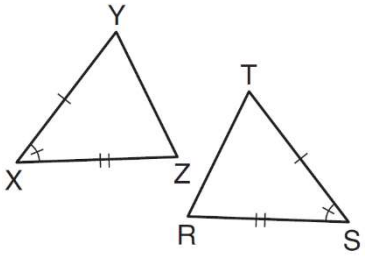
2)



3)



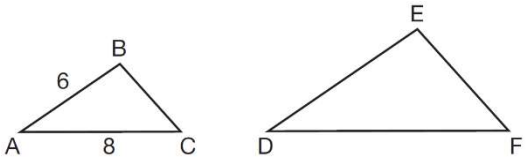
4)



11. In the diagram below, $\triangle ABC \sim \triangle DEF$.

If $AB = 6$ and $AC = 8$, which statement will justify similarity by SAS?

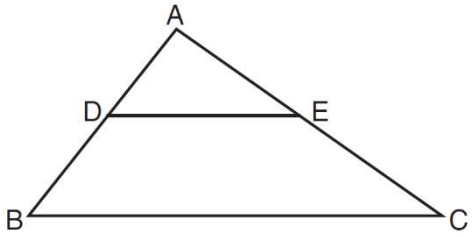
1) $DE = 9$, $DF = 12$, and $\angle A \cong \angle D$
2) $DE = 8$, $DF = 10$, and $\angle A \cong \angle D$
3) $DE = 36$, $DF = 64$, and $\angle C \cong \angle F$
4) $DE = 15$, $DF = 20$, and $\angle C \cong \angle F$



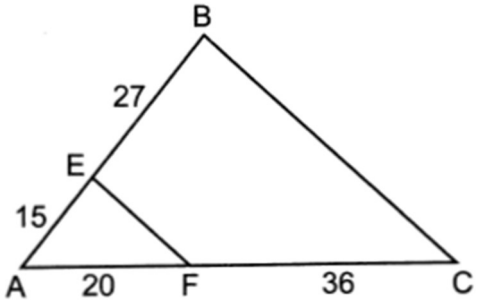
12. In the diagram below, $\triangle ABC \sim \triangle ADE$.

Which measurements are justified by this similarity?

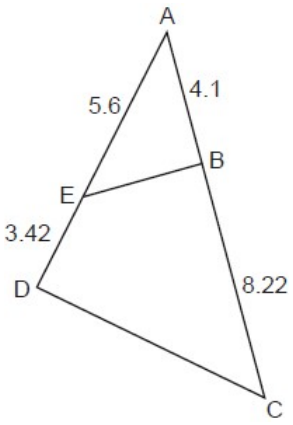
1) $AD = 3$, $AB = 6$, $AE = 4$, and $AC = 12$
2) $AD = 5$, $AB = 8$, $AE = 7$, and $AC = 10$
3) $AD = 3$, $AB = 9$, $AE = 5$, and $AC = 10$
4) $AD = 2$, $AB = 6$, $AE = 5$, and $AC = 15$



13. In the diagram below, $AE = 15$, $EB = 27$, $AF = 20$, and $FC = 36$. Is $\Delta ABC \sim \Delta AEF$. Explain your answer.

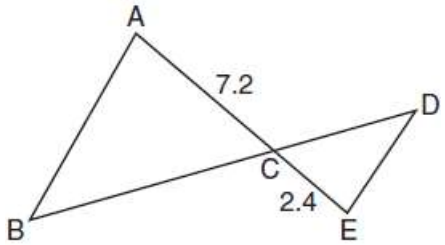


14. In $\triangle ADC$ below, $\overline{EB}$ is drawn such that $AB = 4.1$, $AE = 5.6$, $BC = 8.22$, and $ED = 3.42$. Is $\triangle ABE$ similar to $\triangle ADC$? Explain why.



15. In the diagram below, $AC = 7.2$ and $CE = 2.4$.
Which statement is *not* sufficient to prove $\triangle ABC \sim \triangle EDC$?

1) $\overline{AB} \parallel \overline{ED}$
2) $DE = 2.7$ and $AB = 8.1$
3) $CD = 3.6$ and $BC = 10.8$
4) $DE = 3.0$, $AB = 9.0$, $CD = 2.9$, and $BC = 8.7$

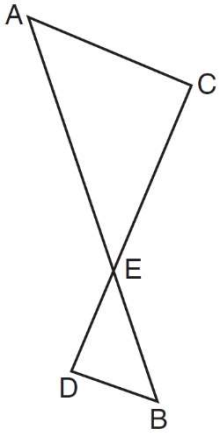


Name _____ Date _____

Mr. Schlansky Geometry

Determining If a Proportion Is Correct

1. As shown in the diagram below, $\overline{AB}$ and $\overline{CD}$ intersect at E, and $\overline{AC} \parallel \overline{BD}$. Given $\triangle AEC \sim \triangle BED$, which equation is true?



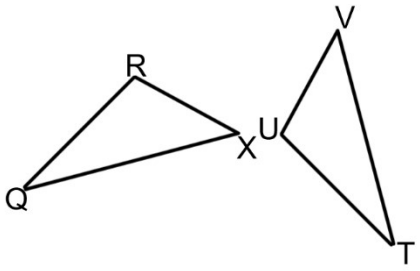
1) $\frac{CE}{DE} = \frac{EB}{EA}$

2) $\frac{AE}{BE} = \frac{AC}{BD}$

3) $\frac{EC}{AE} = \frac{BE}{ED}$

4) $\frac{ED}{EC} = \frac{AC}{BD}$

2. In the diagram below, $\Delta QRX \sim \Delta TUV$. Which of the following statements is *not* true?



1) $\frac{\overline{QR}}{\overline{TU}} = \frac{\overline{QX}}{\overline{TV}}$

2) $\frac{\angle X}{\angle V} = \frac{\angle Q}{\angle T}$

3) $\frac{\overline{RX}}{\overline{UV}} = \frac{\overline{VT}}{\overline{XQ}}$

4) $\frac{\overline{QX}}{\overline{QR}} = \frac{\overline{TV}}{\overline{TU}}$

3. Given that $\Delta DEF \sim \Delta HIJ$, which is the correct statement about their corresponding sides?

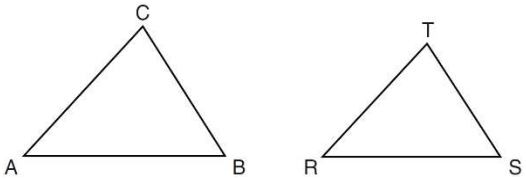
1) $\frac{\overline{EF}}{\overline{IJ}} = \frac{\overline{DE}}{\overline{HI}}$

2) $\frac{\overline{EF}}{\overline{HI}} = \frac{\overline{IJ}}{\overline{DE}}$

3) $\frac{\overline{DE}}{\overline{HJ}} = \frac{\overline{EF}}{\overline{HI}}$

4) $\frac{\overline{DE}}{\overline{JI}} = \frac{\overline{EF}}{\overline{HJ}}$

4. In the diagram below, $\triangle ABC \sim \triangle RST$.



Which statement is *not* true?

1) $\angle A \cong \angle R$

2) $\frac{AB}{RS} = \frac{BC}{ST}$

3) $\frac{AB}{BC} = \frac{ST}{RS}$

4) $\angle B \cong \angle S$

5. Scalene triangle ABC is similar to triangle DEF. Which statement is *false*?

1) $\frac{\overline{AB}}{\overline{BC}} = \frac{\overline{DE}}{\overline{EF}}$

2) $\frac{\overline{AC}}{\overline{DF}} = \frac{\overline{BC}}{\overline{EF}}$

3) $\angle ACB \cong \angle DFE$

4) $\angle ABC \cong \angle EDF$

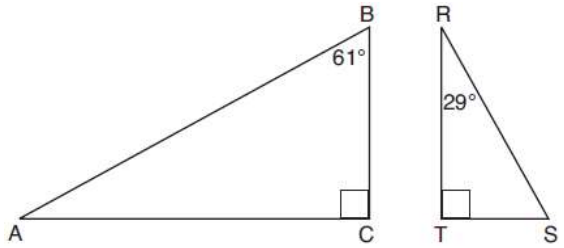
6. Given right triangle ABC with a right angle at C, $m\angle B = 61°$. Given right triangle RST with a right angle at T, $m\angle R = 29°$.
Which proportion in relation to $\triangle ABC$ and $\triangle RST$ is *not* correct?

1) $\frac{AB}{RS} = \frac{RT}{AC}$

2) $\frac{BC}{ST} = \frac{AB}{RS}$

3) $\frac{BC}{ST} = \frac{AC}{RT}$

4) $\frac{AB}{AC} = \frac{RS}{RT}$



7. In the diagram below, $\triangle DEF$ is the image of $\triangle ABC$ after a clockwise rotation of 180° and a dilation where $AB = 3$, $BC = 5.5$, $AC = 4.5$, $DE = 6$, $FD = 9$, and $EF = 11$.

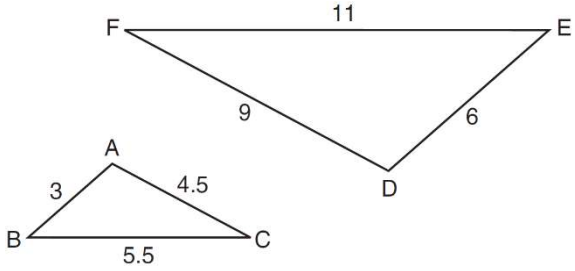
Which relationship must always be true?

1) $\frac{m\angle A}{m\angle D} = \frac{1}{2}$

2) $\frac{m\angle C}{m\angle F} = \frac{2}{1}$

3) $\frac{m\angle A}{m\angle C} = \frac{m\angle F}{m\angle D}$

4) $\frac{m\angle B}{m\angle E} = \frac{m\angle C}{m\angle F}$



8. In the diagram below of isosceles triangle AHE with the vertex angle at H, $\overline{CB} \perp \overline{AE}$ and $\overline{FD} \perp \overline{AE}$.

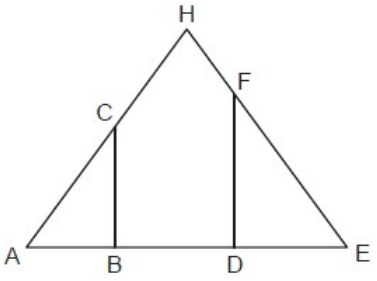
Which statement is always true?

1) $\frac{AH}{AC} = \frac{EH}{EF}$

2) $\frac{AC}{EF} = \frac{AB}{ED}$

3) $\frac{AB}{ED} = \frac{CB}{FE}$

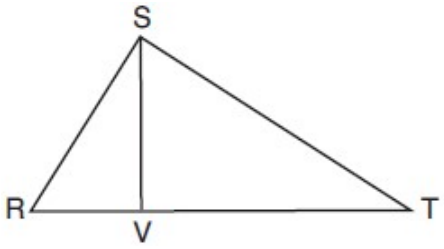
4) $\frac{AD}{AB} = \frac{BE}{DE}$



Name _____ Date _____
Mr. Schlansky Geometry

Determining If a Proportion Is Correct (Candy Corn and HLLS SAAS)

1. In right triangle *RST* below, altitude $\overline{SV}$ is drawn to hypotenuse $\overline{RT}$. Which of the following proportions is true?



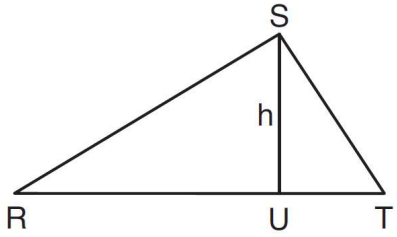
1) $\frac{\overline{RV}}{\overline{VS}} = \frac{\overline{VT}}{\overline{VS}}$

2) $\frac{\overline{RT}}{\overline{RS}} = \frac{\overline{RS}}{\overline{VT}}$

3) $\frac{\overline{RT}}{\overline{SV}} = \frac{\overline{SV}}{\overline{VT}}$

4) $\frac{\overline{RT}}{\overline{ST}} = \frac{\overline{ST}}{\overline{VT}}$

2. In right triangle *RST* below, altitude $\overline{SU}$ is drawn to hypotenuse $\overline{RT}$. Which of the following proportions is *not* true?



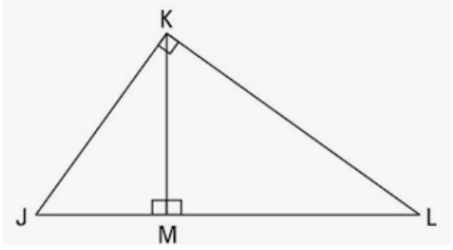
1) $\frac{\overline{RU}}{\overline{SU}} = \frac{\overline{SU}}{\overline{UT}}$

2) $\frac{\overline{SU}}{\overline{RU}} = \frac{\overline{RU}}{\overline{UT}}$

3) $\frac{\overline{RT}}{\overline{RS}} = \frac{\overline{RS}}{\overline{RU}}$

4) $\frac{\overline{TR}}{\overline{ST}} = \frac{\overline{ST}}{\overline{UT}}$

3. In right triangle *JKL* below, altitude $\overline{KM}$ is drawn to hypotenuse $\overline{JL}$. Which of the following proportions is *not* true?



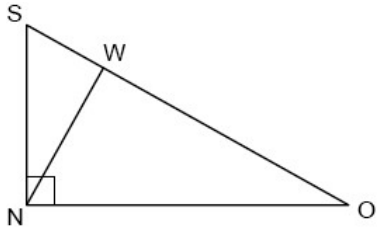
1) $\frac{\overline{JL}}{\overline{JK}} = \frac{\overline{JK}}{\overline{JM}}$

2) $\frac{\overline{JM}}{\overline{KM}} = \frac{\overline{KM}}{\overline{ML}}$

3) $\frac{\overline{JL}}{\overline{KL}} = \frac{\overline{KL}}{\overline{JM}}$

4) $\frac{\overline{ML}}{\overline{MK}} = \frac{\overline{MK}}{\overline{MJ}}$

4. In right triangle *SNO* below, altitude $\overline{NW}$ is drawn to hypotenuse $\overline{SO}$.



Which statement is *not* always true?

1) $\frac{SO}{SN} = \frac{SN}{SW}$

2) $\frac{SW}{NS} = \frac{NS}{OW}$

3) $\frac{SO}{ON} = \frac{ON}{OW}$

4) $\frac{OW}{NW} = \frac{NW}{SW}$

5. In the diagram below of $\triangle ACT$, $\overleftrightarrow{ES}$ is drawn parallel to $\overline{AT}$ such that E is on $\overline{CA}$ and S is on $\overline{CT}$.

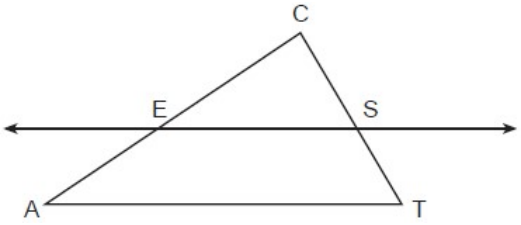
Which statement is always true?

1) $\frac{CE}{CA} = \frac{CS}{ST}$

2) $\frac{CE}{ES} = \frac{EA}{AT}$

3) $\frac{CE}{EA} = \frac{CS}{ST}$

4) $\frac{CE}{ST} = \frac{EA}{CS}$



6. In $\triangle ABC$ below, $\overline{DE}$ is drawn such that D and E are on $\overline{AB}$ and $\overline{AC}$, respectively.

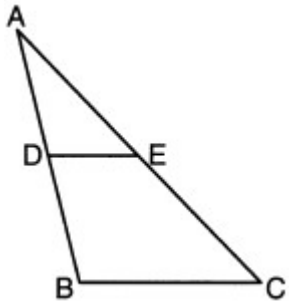
If $\overline{DE} \parallel \overline{BC}$, which equation will always be true?

1) $\frac{AD}{DE} = \frac{DB}{BC}$

2) $\frac{AD}{DE} = \frac{AB}{BC}$

3) $\frac{AD}{BC} = \frac{DE}{DB}$

4) $\frac{AD}{BC} = \frac{DE}{AB}$



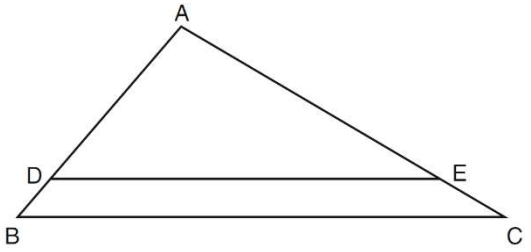
7. In the diagram of $\triangle ABC$ shown below, $\overline{DE} \parallel \overline{BC}$. Which of the following statements is *not* true?

1) $\frac{\overline{AD}}{\overline{DE}} = \frac{\overline{AB}}{\overline{BC}}$

2) $\frac{\overline{BC}}{\overline{DE}} = \frac{\overline{CA}}{\overline{EA}}$

3) $\frac{\overline{AD}}{\overline{AE}} = \frac{\overline{DB}}{\overline{AC}}$

4) $\frac{\overline{DB}}{\overline{EC}} = \frac{\overline{AB}}{\overline{AC}}$



8. In the diagram below of right triangle AED, $\overline{BC} \parallel \overline{DE}$.

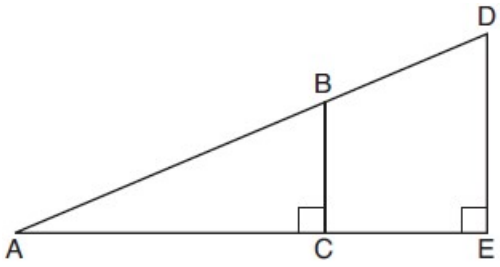
Which statement is always true?

1) $\frac{AC}{BC} = \frac{DE}{AE}$

2) $\frac{AB}{AD} = \frac{BC}{DE}$

3) $\frac{AC}{CE} = \frac{BC}{DE}$

4) $\frac{DE}{BC} = \frac{DB}{AB}$

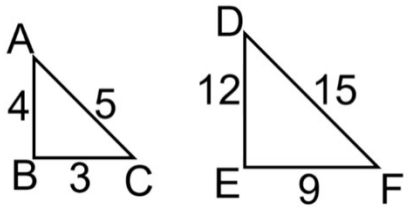


Name _____ Date _____
Mr. Schlansky Geometry

Scale Factor

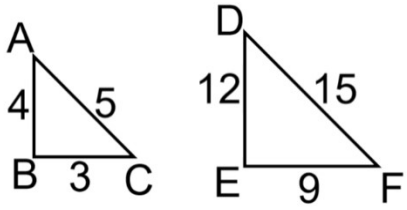
1. In the diagram below, ΔDEF is the image of ΔABC after a dilation.

What is the scale factor of the dilation?



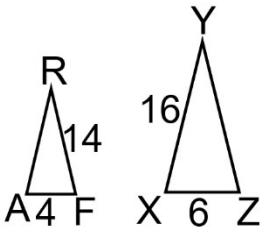
2. In the diagram below, ΔABC is the image of ΔDEF after a dilation.

What is the scale factor of the dilation?

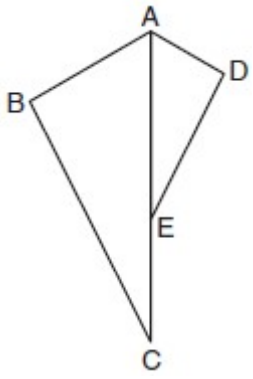


3. In the diagram below, ΔXYZ is the image of ΔARF after a dilation.

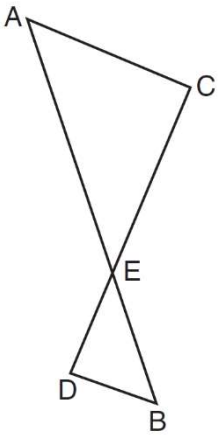
What is the scale factor of the dilation?



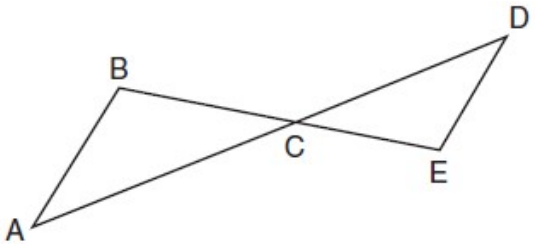
4. In the diagram below, $\triangle ADE$ is the image of $\triangle ABC$ after a reflection over the line AC followed by a dilation centered at point A. If $\overline{AB} = 12$, $\overline{DE} = 6$, and $\overline{AD} = 9$, what is the scale factor of the dilation?



5. In the diagram below, ΔACE is the image of ΔBDE after a sequence of transformations. If $\overline{AE} = 6$, $\overline{DE} = 3$, and $\overline{EB} = 4$, what is the scale factor?



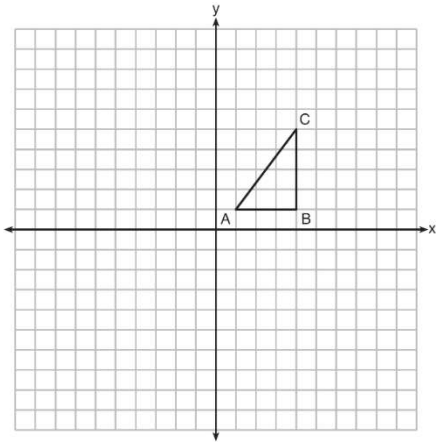
6. In the diagram below, ΔDCE is the image of ΔACB after a sequence of transformations. If $\overline{AC} = 9$, $\overline{CE} = 3$, and $\overline{CD} = 6$, what is the scale factor?



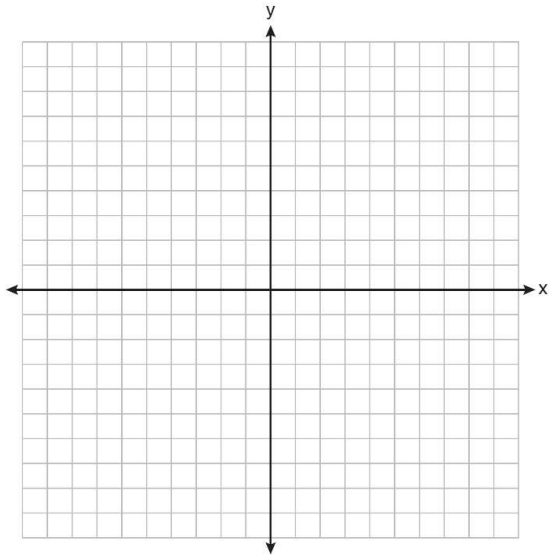
7. After a dilation with center $(0,0)$, the image of $\overline{DB}$ is $\overline{D'B'}$. If $DB = 4.5$ and $D'B' = 18$, what is the scale factor of this dilation?

8. $\overline{DR}$ is dilated centered at point D such that $\overline{DR} = 8$ and $\overline{D'R'} = 12$. What is the scale factor of the dilation?

9. In the diagram below, $\triangle ABC$ has coordinates $A(1,1)$, $B(4,1)$, and $C(4,5)$. The coordinates of its image after a sequence of transformations is $A'(-9,-2), B'(-3,-2),$ *and* $C'(-3,6)$. What is the scale factor?



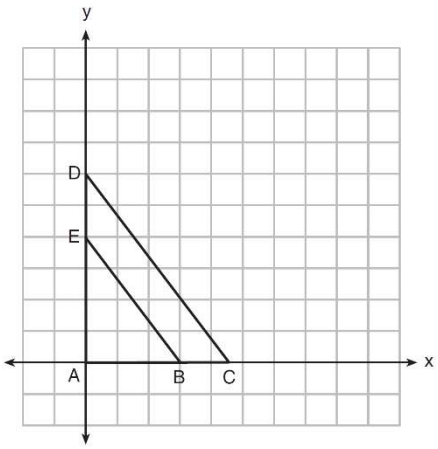
10. $\triangle ABC$ has coordinates $A(-2,8), B(6,8),$ *and* $C(8,5)$. The coordinates of ΔXYZ, the image of ΔABC after a sequence of transformations is $X(1,2), Y(7,2),$ *and* $Z(8,0)$. What is the scale factor?



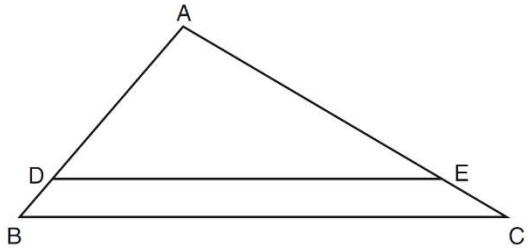
11. In the diagram below, $\triangle ABE$ is the image of $\triangle ACD$ after a dilation centered at the origin. The coordinates of the vertices are $A(0,0)$, $B(3,0)$, $C(4.5,0)$, $D(0,6)$, and $E(0,4)$.

The scale factor of dilation is

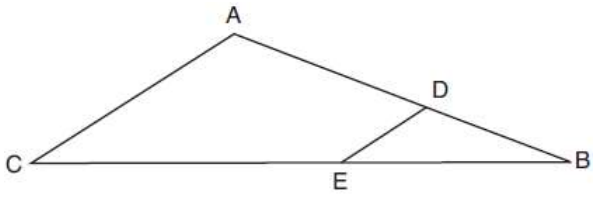
1) $\frac{2}{3}$
2) $\frac{3}{2}$
3) $\frac{3}{4}$
4) $\frac{4}{3}$



12. In the diagram shown below, ΔADE is the image of ΔABC after a dilation of k centered at point A. If $AB = 10$, $AD = 8$, and $AE = 12$, what is the value of k?



13. In the diagram below, ΔABC is the image of ΔDBE after a dilation centered at point A. If $\overline{AB} = 20$, $\overline{DE} = 8$, and $\overline{DB} = 10$, what is the scale factor?



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Scale Factor with Perimeter and Area

1. The scale factor of a triangle dilation is 3. What is the scale factor of their:
   a) perimeters
   b) areas
   c) angles

2. The ratio of the sides of similar triangles is 5:1. What is the ratio of their:
   a) perimeters
   b) areas
   c) angles

3. The scale factor of a triangle dilation is $\frac{1}{2}$. What is the scale factor of their:
   a) perimeters
   b) areas
   c) angles

4. The ratio of the sides of similar triangles is 4:3. What is the ratio of their:
   a) perimeters
   b) areas
   c) angles

5. Two triangles are similar, and the ratio of each pair of corresponding sides is 2 : 1. Which statement regarding the two triangles is *not* true?
1) Their areas have a ratio of 4 : 1.
2) Their altitudes have a ratio of 2 : 1.
3) Their perimeters have a ratio of 2 : 1.
4) Their corresponding angles have a ratio of 2 : 1.

6. Given $\triangle ABC \sim \triangle DEF$ such that $\frac{AB}{DE} = \frac{3}{2}$. Which statement is *not* true?

1) $\frac{BC}{EF} = \frac{3}{2}$
2) $\frac{\text{m}\angle A}{\text{m}\angle D} = \frac{3}{2}$
3) $\frac{\text{area of } \triangle ABC}{\text{area of } \triangle DEF} = \frac{9}{4}$
4) $\frac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle DEF} = \frac{3}{2}$

7. $\triangle ABC$ is similar to $\triangle DEF$. The ratio of the length of $\overline{AB}$ to the length of $\overline{DE}$ is $3:1$. Which ratio is also equal to $3:1$?

(1) $\frac{\text{m}\angle A}{\text{m}\angle D}$ (2) $\frac{\text{m}\angle B}{\text{m}\angle F}$ (3) $\frac{\text{area of } \triangle ABC}{\text{area of } \triangle DEF}$ (4) $\frac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle DEF}$

8. Triangle JOY has a perimeter of 10 and an area of 12. What is the perimeter and area of triangle JOY after a dilation by a scale factor of 2?

9. Quadrilateral CAMI has a perimeter of 20 and an area of 15. What is the perimeter and area of quadrilateral CAMI after a dilation by a scale factor of 4?

10. Triangle *RJM* has an area of 6 and a perimeter of 12. If the triangle is dilated by a scale factor of 3 centered at the origin, what are the area and perimeter of its image, triangle *R′J′M′*?

1) area of 9 and perimeter of 15
2) area of 18 and perimeter of 36
3) area of 54 and perimeter of 36
4) area of 54 and perimeter of 108

11. Rectangle *A′B′C′D′* is the image of rectangle *ABCD* after a dilation centered at point *A* by a scale factor of $\frac{2}{3}$. Which statement is correct?

1) Rectangle *A′B′C′D′* has a perimeter that is $\frac{2}{3}$ the perimeter of rectangle *ABCD*.
2) Rectangle *A′B′C′D′* has a perimeter that is $\frac{3}{2}$ the perimeter of rectangle *ABCD*.
3) Rectangle *A′B′C′D′* has an area that is $\frac{2}{3}$ the area of rectangle *ABCD*.
4) Rectangle *A′B′C′D′* has an area that is $\frac{3}{2}$ the area of rectangle *ABCD*.

12. A triangle is dilated by a scale factor of 3 with the center of dilation at the origin. Which statement is true?

1) The area of the image is nine times the area of the original triangle.
2) The perimeter of the image is nine times the perimeter of the original triangle.
3) The slope of any side of the image is three times the slope of the corresponding side of the original triangle.
4) The measure of each angle in the image is three times the measure of the corresponding angle of the original triangle.

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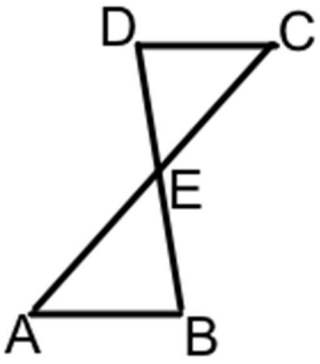
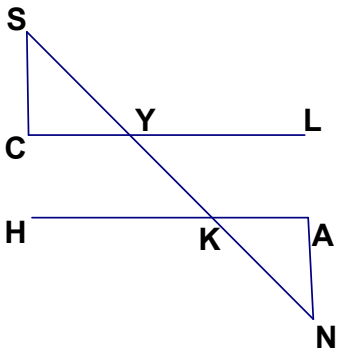
Similar Triangles Proofs

1. Given $\angle A \cong \angle C$
   Prove: $\Delta ABE \sim \Delta CDE$



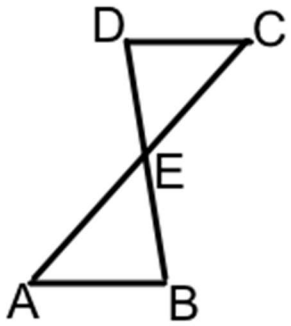
2. Given: $\overline{CL} \parallel \overline{HA}$, $\angle CSY \cong \angle ANK$
   Prove: $\Delta SCY \sim \Delta NAK$



3. Given: $\overline{BC} \perp \overline{AC}$
   $\overline{DE} \perp \overline{AB}$
   Prove: $\Delta ABC \sim \Delta ADE$

4. Given $\overline{AB} \parallel \overline{DC}$

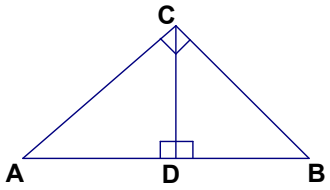
Prove: $\Delta ABE \sim \Delta CDE$



5. Given: $\overline{CD}$ is an altitude

$\overline{BC} \perp \overline{AC}$

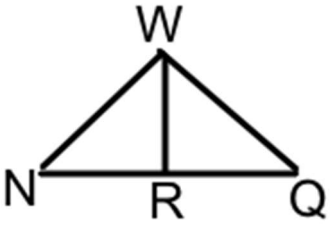
Prove: $\Delta ADC \sim \Delta ACB$



6. Given: $\overline{WR}$ bisects $\angle NWQ$

$\overline{WN} \cong \overline{WQ}$

Prove: $\Delta RWN \sim \Delta RWQ$



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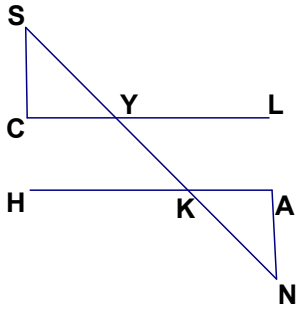
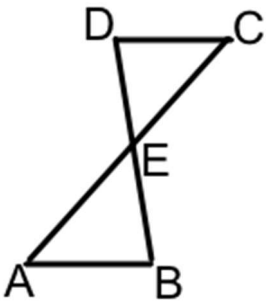
Proving Multiplication Mini Proofs

1. Given: None
   Prove: $\overline{SC} \bullet \overline{NK} = \overline{NA} \bullet \overline{SY}$

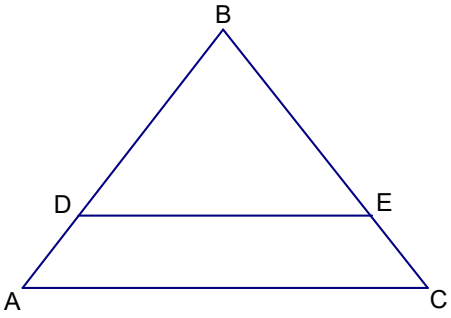


2. Given: None
   Prove: $\overline{CD} \bullet \overline{AE} = \overline{AB} \bullet \overline{CE}$

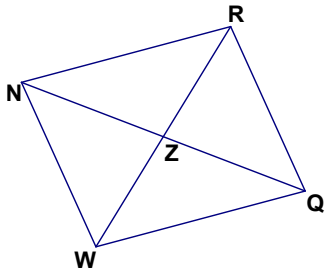


3. Given: None
   Prove: $\overline{AC} \bullet \overline{DE} = \overline{AE} \bullet \overline{BC}$

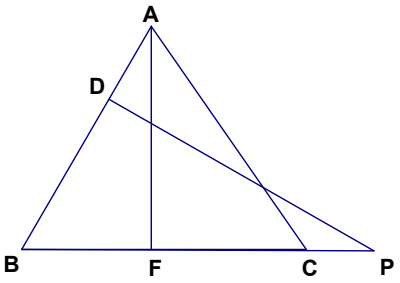
4. Given: None
   Prove: $\overline{BE} \bullet \overline{AB} = \overline{DB} \bullet \overline{BC}$



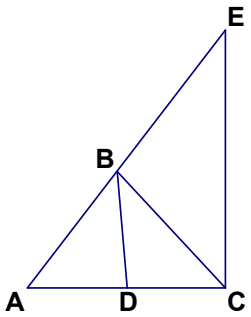
5. Given: None
Prove: $\overline{RZ} \bullet \overline{QW} = \overline{RQ} \bullet \overline{ZW}$



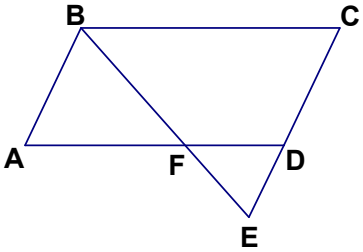
6. Given: None
Prove: $\overline{FC} \bullet \overline{PB} = \overline{DB} \bullet \overline{AC}$



7. Given: None
Prove: $\overline{AD} \bullet \overline{EA} = \overline{BA} \bullet \overline{AC}$



8. Given: None
Prove: $\overline{AB} \bullet \overline{DF} = \overline{AF} \bullet \overline{FE}$



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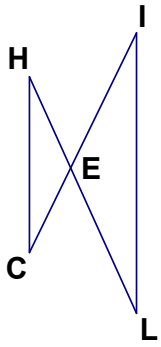
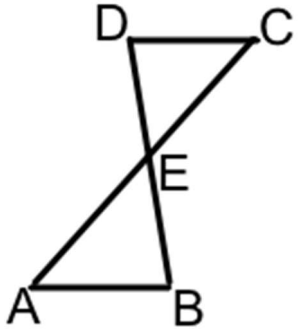
Proving Proportions and Multiplication

1. Given: $\angle HCE \cong \angle LIE$
   Prove: $\overline{CE} \bullet \overline{IL} = \overline{CH} \bullet \overline{EI}$



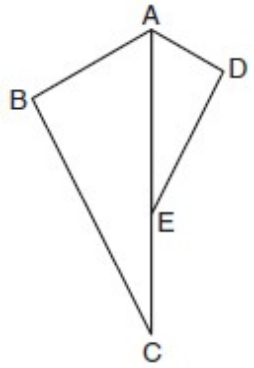
2. Given $\overline{AB} \parallel \overline{DC}$
   Prove: $\overline{DC} \bullet \overline{EB} = \overline{AB} \bullet \overline{DE}$



3. Given: $\overline{BC} \perp \overline{AC}$
   $\overline{DE} \perp \overline{AB}$
   Prove: $\overline{AC} \bullet \overline{AD} = \overline{AE} \bullet \overline{AB}$

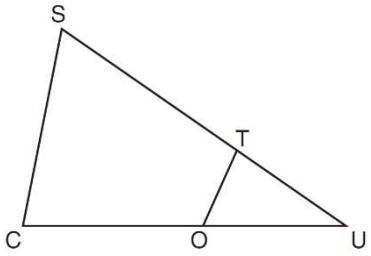
4. Given: $\overline{CA}$ bisects $\angle BAD$, $\angle ABC \cong \angle ADE$

Prove: $\overline{BC} \bullet \overline{AE} = \overline{DE} \bullet \overline{AC}$



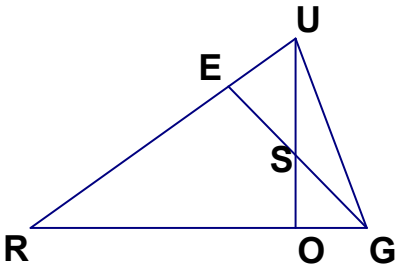
5. Given: $\angle C \cong \angle OTU$.

Prove: $\overline{SC} \bullet \overline{OU} = \overline{OT} \bullet \overline{SU}$



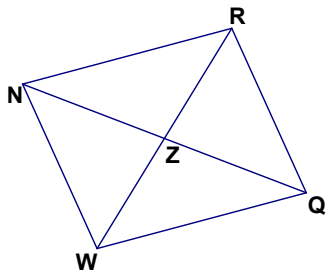
6. Given: $\overline{UO} \perp \overline{RG}$, $\overline{UR} \perp \overline{EG}$

Prove: $\dfrac{\overline{US}}{\overline{SO}} = \dfrac{\overline{EU}}{OG}$



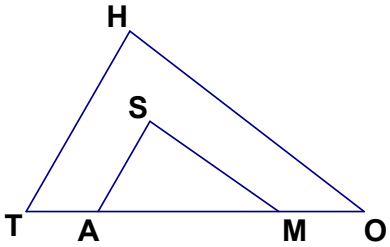
7. Given: $\overline{NQ} \perp \overline{RW}$, $\overline{NQ}$ bisects $\angle$ RQW

Prove: $\overline{RZ} \bullet \overline{QW} = \overline{RQ} \bullet \overline{ZW}$



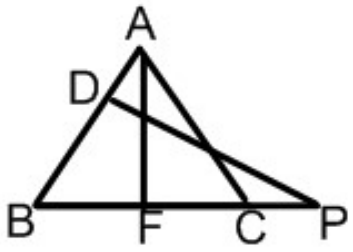
8. Given: $\overline{TH} \parallel \overline{AS}$, $\overline{SM} \parallel \overline{HO}$

Prove: $\overline{TH} \bullet \overline{SM} = \overline{AS} \bullet \overline{HO}$



9. Given: $\overline{AB} \cong \overline{AC}$, $\overline{AF} \perp \overline{BC}$, $\overline{PD} \perp \overline{AB}$

Prove: $\overline{FC} \bullet \overline{PB} = \overline{DB} \bullet \overline{AC}$



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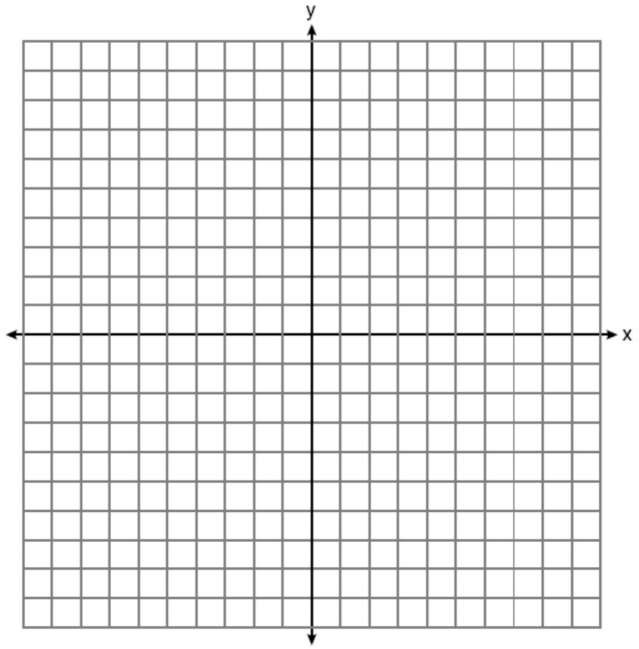
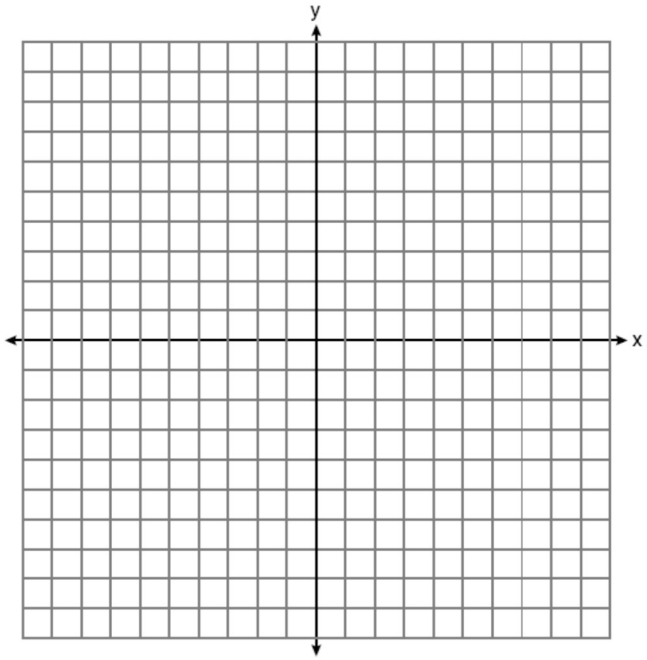
Similar Triangles Review Sheet

1. Triangle *SUN* has coordinates *S*(0,6), *U*(3,5), and *N*(3,0). On the accompanying grid, draw and label $\triangle SUN$. Then, graph and state the coordinates of $\triangle S'U'N'$, the image of $\triangle SUN$ after a dilation of 2 centered at (-1,4).

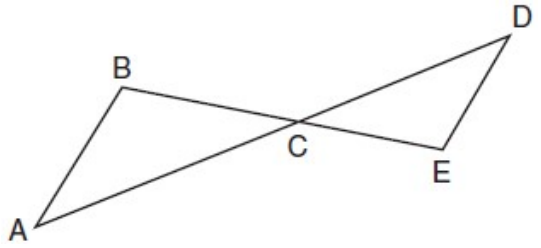


2. Triangle ABC has coordinates $A(2,1)$, $B(6,1)$, $C(5,3)$. What is the image of this triangle after a dilation of 4 centered at (6,4). Graph both the image and the pre image.

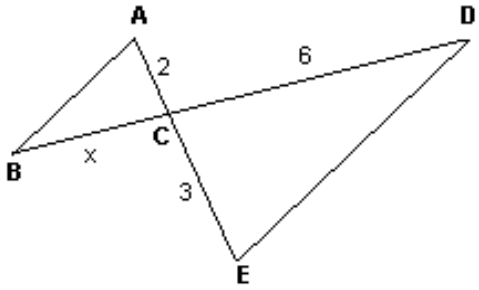


3. In the diagram below, $\overline{AD}$ intersects $\overline{BE}$ at C, and $\overline{AB} \| \overline{DE}$.

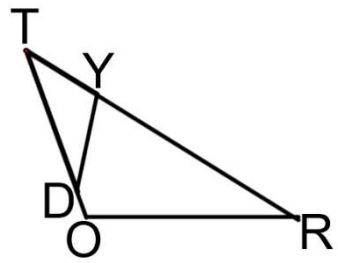
If $CD = 6.6$ cm, $DE = 3.4$ cm, $CE = 4.2$ cm, and $BC = 5.25$ cm, what is the length of $\overline{AC}$, to the *nearest hundredth of a centimeter*?



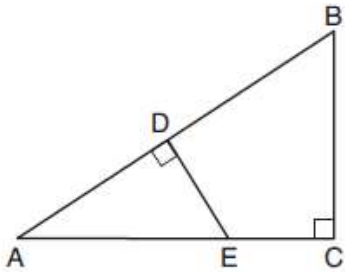
4. In the diagram below, $\overline{AB} \| \overline{DE}$. If $AC = 2$, $CD = 6$, and $CE = 3$, what is BC?



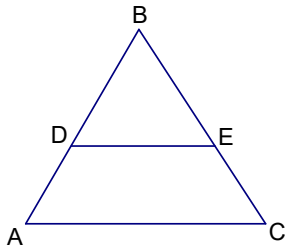
5. In triangle TOR, Y is on $\overline{TR}$, and D is on $\overline{TO}$ so that $\angle TYD \cong \angle ROT$.
If $\overline{TY} = 2$, $\overline{YR} = 6$, and $\overline{TD} = 4$, find $\overline{TO}$.



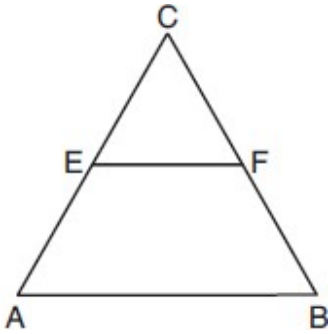
6. In $\triangle ABC$ shown below, $\angle ACB$ is a right angle, E is a point on $\overline{AC}$, and $\overline{ED}$ is drawn perpendicular to hypotenuse $\overline{AB}$. If $AB = 9$, $BC = 6$, and $DE = 4$, what is the length of $\overline{AE}$?



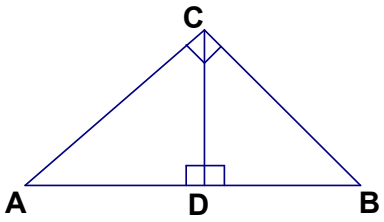
7. D and E are midpoints of $\overline{AB}$ and $\overline{BC}$ respectively. If $\overline{DE} = 2x + 5$ and $\overline{AC} = 7x + 1$, find the measure of $\overline{AC}$.



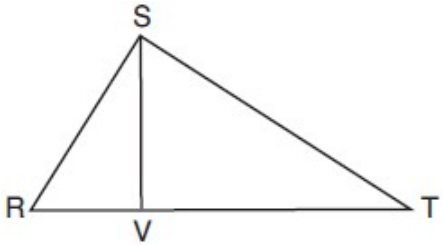
8. In the diagram of ABC shown below, E and F are the midpoints of $\overline{AC}$ and $\overline{BC}$, respectively.
If $EF = 2x + 8$ and $AB = 7x - 2$, what is AB?



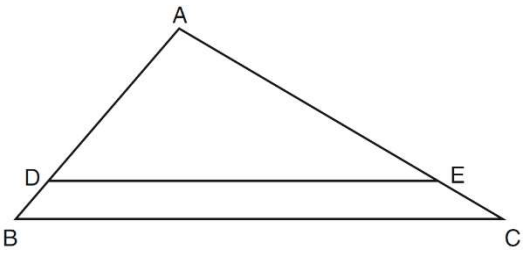
9. If $\overline{AD} = 3$ and $\overline{AB} = 27$, find $\overline{CD}$ to the *nearest tenth*.



10. In right triangle RST below, altitude $\overline{SV}$ is drawn to hypotenuse $\overline{RT}$. If $RV = 4.1$ and $TV = 10.2$, what is the length of $\overline{ST}$, to the *nearest tenth*?



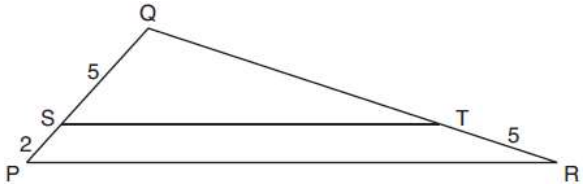
11. In the diagram of $\triangle ABC$ shown below, $\overline{DE} \parallel \overline{BC}$.



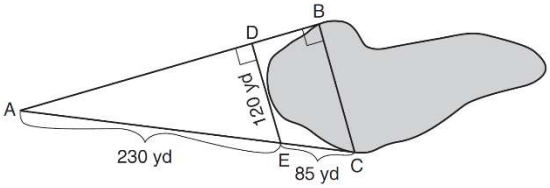
If $AB = 10$, $AD = 8$, and $AE = 12$, what is the length of $\overline{EC}$?

1) 6
2) 2
3) 3
4) 15

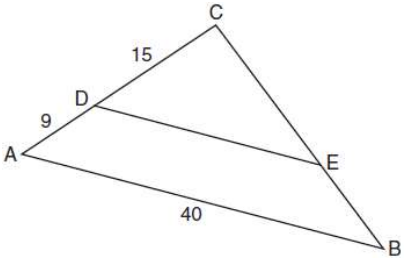
12. In the diagram below of $\triangle PQR$, $\overline{ST}$ is drawn parallel to $\overline{PR}$, $PS = 2$, $SQ = 5$, and $TR = 5$ What is the length of $\overline{QR}$?



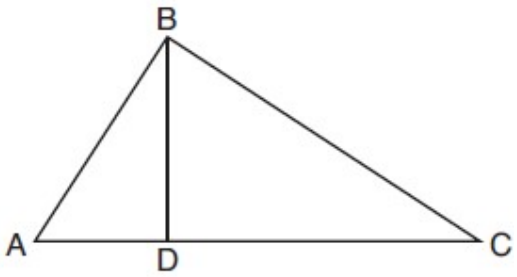
13. To find the distance across a pond from point *B* to point *C*, a surveyor drew the diagram below. The measurements he made are indicated on his diagram.
Use the surveyor's information to determine and state the distance from point *B* to point *C*, to the *nearest yard*.



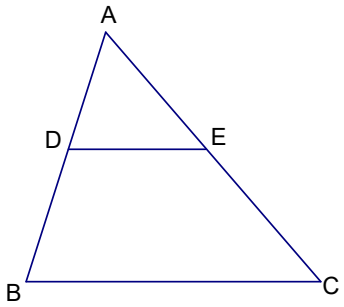
14. In the diagram of $\triangle ABC$ below, $\overline{DE}$ is parallel to $\overline{AB}$, $CD = 15$, $AD = 9$, and $AB = 40$. Find the length of $\overline{DE}$.



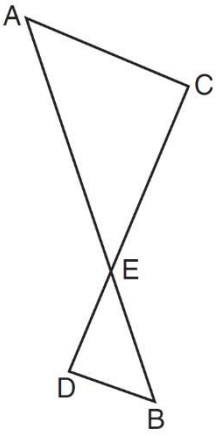
15. In the diagram below of right triangle ABC, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$. If $BD = 4$, $AD = x - 6$, and $CD = x$, what is the length of $\overline{CD}$?



16. In triangle ABC, $\overline{DE} \parallel \overline{BC}$. If $\overline{AD} = 2$, $\overline{DB} = x + 1$, $\overline{AE} = x$, and $\overline{EC} = x + 6$, find $\overline{AE}$



17. As shown in the diagram below, $\overline{AB}$ and $\overline{CD}$ intersect at E, and $\overline{AC} \parallel \overline{BD}$.

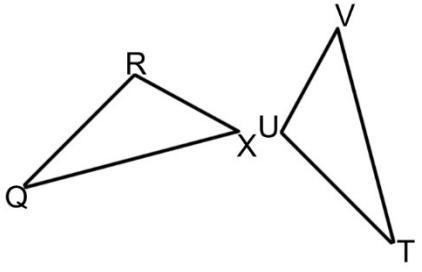


Given $\triangle AEC \sim \triangle BED$, which equation is true?

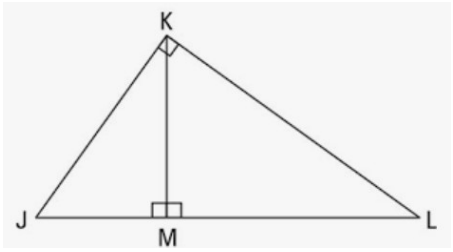
1) $\frac{CE}{DE} = \frac{EB}{EA}$
2) $\frac{EC}{AE} = \frac{BE}{ED}$
3) $\frac{AE}{BE} = \frac{AC}{BD}$
4) $\frac{ED}{EC} = \frac{AC}{BD}$

18. In the diagram below, $\Delta QRX \sim \Delta TUV$. Which of the following statements is *not* true?

1) $\frac{\overline{QR}}{\overline{TU}} = \frac{\overline{QX}}{\overline{TV}}$
2) $\frac{\angle X}{\angle V} = \frac{\angle Q}{\angle T}$
3) $\frac{\overline{RX}}{\overline{UV}} = \frac{\overline{VT}}{\overline{XQ}}$
4) $\frac{\overline{QX}}{\overline{QR}} = \frac{\overline{TV}}{\overline{TU}}$



19. In right triangle *JKL* below, altitude $\overline{KM}$ is drawn to hypotenuse $\overline{JL}$. Which of the following proportions is *not* true?



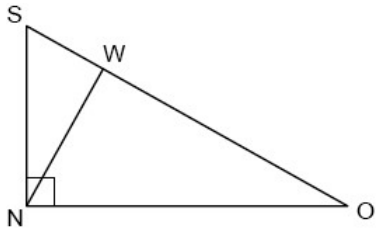
1) $\frac{\overline{JL}}{\overline{JK}} = \frac{\overline{JK}}{\overline{JM}}$

2) $\frac{\overline{JM}}{\overline{KM}} = \frac{\overline{KM}}{\overline{ML}}$

3) $\frac{\overline{JL}}{\overline{KL}} = \frac{\overline{KL}}{\overline{JM}}$

4) $\frac{\overline{ML}}{\overline{MK}} = \frac{\overline{MK}}{\overline{MJ}}$

20. In right triangle *SNO* below, altitude $\overline{NW}$ is drawn to hypotenuse $\overline{SO}$.



Which statement is *not* always true?

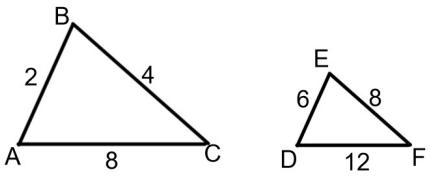
1) $\frac{SO}{SN} = \frac{SN}{SW}$

2) $\frac{SW}{NS} = \frac{NS}{OW}$

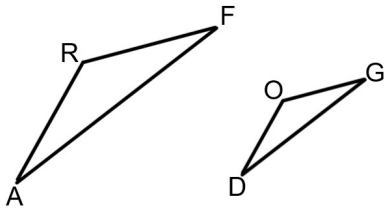
3) $\frac{SO}{ON} = \frac{ON}{OW}$

4) $\frac{OW}{NW} = \frac{NW}{SW}$

21. Determine whether the following triangles are similar. Explain your answer.



22. In the diagram below, $\overline{AR} = 15$, $\overline{RF} = 12$, $\overline{DO} = 10$, $\overline{OG} = 8$, and $\angle ARF \cong \angle DOG$. Must $\Delta ARF \sim \Delta DOG$? Explain your answer.



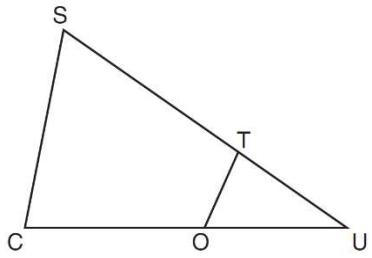
23. After a dilation with center $(0, 0)$, the image of $\overline{DB}$ is $\overline{D'B'}$. If $DB = 4.5$ and $D'B' = 18$, what is the scale factor of this dilation?

24. $\overline{DR}$ is dilated centered at point D such that $\overline{DR} = 8$ and $\overline{D'R'} = 12$. What is the scale factor of the dilation?

25. Triangle JOY has a perimeter of 10 and an area of 12. What is the perimeter and area of triangle JOY after a dilation by a scale factor of 2?

26. Quadrilateral CAMI has a perimeter of 20 and an area of 15. What is the perimeter and area of quadrilateral CAMI after a dilation by a scale factor of 4?

27. Given: $\angle C \cong \angle OTU$.
Prove: $\overline{SC} \bullet \overline{OU} = \overline{OT} \bullet \overline{SU}$



28. Given: $\overline{GI}$ is parallel to $\overline{NT}$.

Prove: $\overline{IA} \bullet \overline{TN} = \overline{IG} \bullet \overline{AN}$