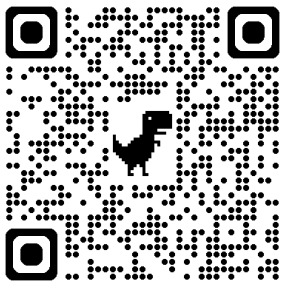
Name:

Common Core Geometry

Unit 1

Triangles and Parallel Lines Cut By a Transversal

Mr. Schlansky



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Lesson 1: I can identify sides by stating their endpoints. I can identify angles by identifying the vertex (middle letter) and which directions is opens.
To name a line segment, state the two endpoints and put a line segment above them. Segments are always named with two letters.
To name an angle, the middle letter is the vertex. The vertex is where the angles come together. The two outside letters are where the angle opens up from the vertex. Angles are correctly named using 3 letters but are at times named using 1 letter.

Lesson 2: I can classify triangles by their angles and congruence using the given definitions.

Scalene triangles have 0 congruent sides/angles	Acute triangles have 3 acute angles
Isosceles triangles have 2 congruent sides/angles	Obtuse triangles have 1 obtuse angle
Equilateral triangles have 3 congruent sides/angles	Right triangles have 1 right angle

The angles of a triangle add to equal 180.
When given two angles of a triangle, add them up and subtract from 180 to find the third angle.

Lesson 3: I can classify triangles by using algebra and the given definitions.
1) Add up the three angles of a triangle to equal 180
2) Solve the equation
3) Substitute x into each expression to find the three angles
4) Classify the triangle using the definitions from Lesson 2.

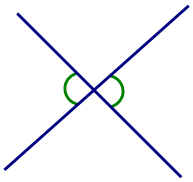
Lesson 4: I can use "exterior angle theorem" by adding the sum of the two non-adjacent interior angles to equal the exterior angle.
The sum of the two non-adjacent interior angles is equal to the exterior angle.

Lesson 5: I can determine the largest side of a triangle by understanding that the largest side is opposite the largest angle.
1) Find the three angles of the triangle (add up and subtract from 180)
2) The largest side is opposite the largest angle, the middle side is opposite the middle angle, and the smallest side is opposite the smallest angle

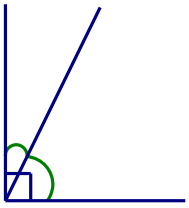
Lesson 6: I can determine whether or not three numbers can be the sides of a triangle and find the range of possible values of the third side of the triangle using the triangle inequality theorem.
Triangle Inequality Theorem: The two smallest sides of a triangle must add up to be greater than the third side.
To determine the range of possible sides for the third side:
1) Add the two sides
2) Subtract the two sides
3) $difference < third\ side < sum$

Lesson 7: I can identify linear pairs and classify angle pairs as vertical, supplementary, and vertical.

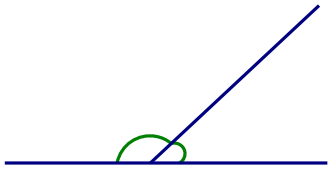
Vertical angles are congruent



Complementary angles add to 90

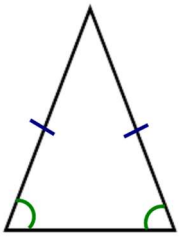


Supplementary angles add to 180
Linear pairs are adjacent supplementary angles

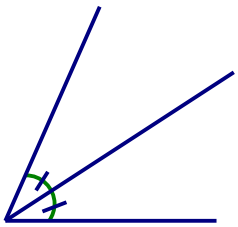


Lesson 8: I can find an angle of a triangle using the theorem "congruent angles are opposite congruent sides."
I can find an angle using the definition "an angle bisector cuts an angle into two congruent angles"
I can find an angle of a triangle using the definition "the angles of an equilateral triangle are 60, 60, 60."

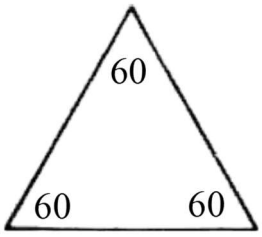
Isosceles Triangle Theorem: In a triangle, congruent angles are opposite congruent sides.



An angle bisector cuts an angle into two congruent angles.



An equilateral triangle has angles 60, 60, 60.



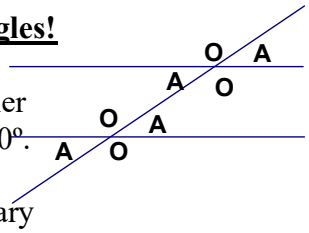
Lesson 9: I can find missing angles of triangles by looking for linear pairs and angles of a triangle, using isosceles triangle theorem, and applying the definitions of angle bisector and equilateral triangle.

Complex Triangle Problems:

1) The three angles of a triangle add to equal 180º. **Look for triangles.**
2) Linear pairs add to 180º. **Look for linear pairs.**
3) Isosceles triangle has congruent angles opposite congruent sides (given congruent sides).
4) Equilateral triangle has angles 60, 60, 60 (given equilateral triangle).
5) An angle bisector cuts an angle into two congruent halves (given bisected angles).

Lesson 10: I can find angles formed given parallel lines by extending the transversal and making all of the same angles congruent and different angles supplementary.

<u>Extend parallel lines and follow the transversal!!!!!!! Fill in all eight angles!</u>



If lines are parallel:

-If the angles are the same (both acute or obtuse), set them equal to each other

-If the angles are different (one acute and one obtuse), add them to equal 180º.

If lines are *not* parallel:

- The same angles are *not* congruent and different angle are *not* supplementary

Lesson 11: I can incorporate parallel lines into complex triangle problems by following the transversal.

Complex Triangle Problems:

1) The three angles of a triangle add to equal 180º. Look for triangles.
2) Linear pairs add to 180º. Look for linear pairs.
3) Isosceles triangle has congruent angles opposite congruent sides (given congruent sides).
4) Equilateral triangle has angles 60, 60, 60 (given equilateral triangle).
5) An angle bisector cuts an angle into two congruent halves (given bisected angles).
6) Use parallel lines cut by a transversal (extend and follow the transversal, fill in 8 angles.)

Lesson 12: I can find missing angles when parallel lines are cut by a transversal by following the transversal and understanding that the same angles are congruent and the different angles are supplementary.

When given parallel lines cut by a transversal and algebraic expressions:

If the angles are the same (both acute or both obtuse): set them equal to each other.

If the angles are different (one acute and one obtuse): add them to equal 180.

Lesson 13: I can find the lengths of segments when medians intersect using the ratio 1:2.

When given intersecting medians (centroid), the medians are cut in a ratio of 1:2.

-If given the small piece, multiply by 2 for the large piece

-If given the large piece, divide by 2 for the small piece

-If given the whole median, divide by 3 for the small piece, multiply that by 2 for the small piece

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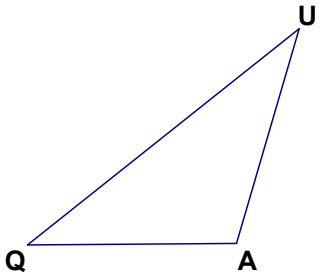
Naming Sides and Angles of Triangles

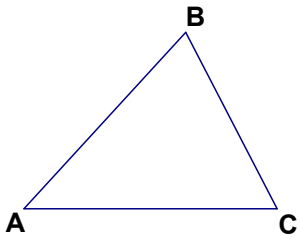
Label the appropriate sides and angles of each triangle

1.



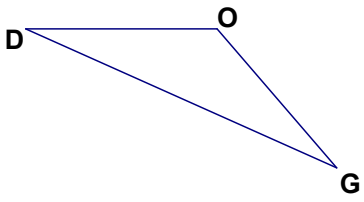
Label $\angle$ QAZ with a 1
Label $\angle$ AUQ with a 2
Label $\angle$ UQA with a 3
Label $\overline{QU}$ with an X
Label $\overline{AU}$ with a Y
Label $\overline{AQ}$ with a Z

2.



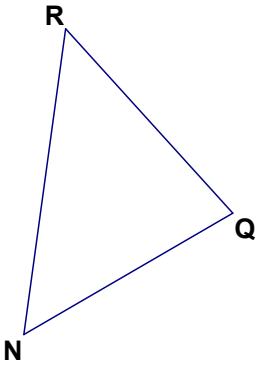
Label $\angle$ BAC with a 1
Label $\angle$ CBA with a 2
Label $\angle$ ACB with a 3
Label $\overline{CB}$ with an X
Label $\overline{AC}$ with a Y
Label $\overline{AB}$ with a Z

3.



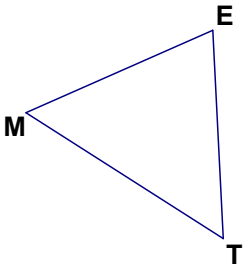
Label $\angle$ GDO with a 1
Label $\angle$ OGD with a 2
Label $\angle$ DOG with a 3
Label $\overline{GD}$ with an X
Label $\overline{OG}$ with a Y
Label $\overline{OD}$ with a Z

4.



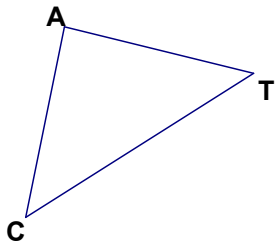
Label $\angle$ QRN with a 1
Label $\angle$ RNQ with a 2
Label $\angle$ RQN with a 3
Label $\overline{NQ}$ with an X
Label $\overline{RQ}$ with a Y
Label $\overline{RN}$ with a Z

5.



Label $\angle$ MET with a 1
Label $\angle$ TME with a 2
Label $\angle$ ETM with a 3
Label $\overline{MT}$ with an X
Label $\overline{ET}$ with a Y
Label $\overline{EM}$ with a Z

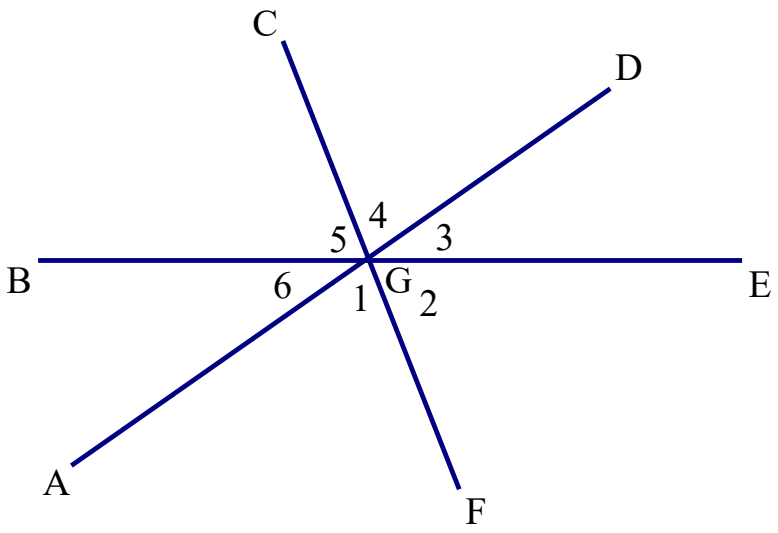
6.



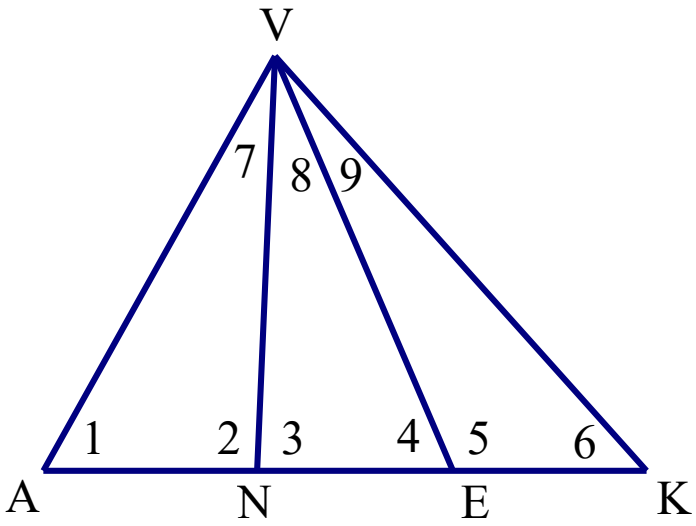
Label $\angle$ ACT with a 1
Label $\angle$ CTA with a 2
Label $\angle$ CAT with a 3
Label $\overline{TA}$ with an X
Label $\overline{CA}$ with a Y
Label $\overline{TC}$ with a Z

Name the following angles using numbers:

7. $\angle CGB$
8. $\angle CGF$
9. $\angle CGE$
10. $\angle FGE$
11. $\angle AGF$
12. $\angle FGB$
13. $\angle AGE$
14. $\angle BGA$
15. $\angle DGC$
16. $\angle DGA$



17. $\angle VEN$
18. $\angle VEA$
19. $\angle AVE$
20. $\angle EVK$
21. $\angle KNV$
22. $\angle VAE$
23. $\angle KVA$
24. $\angle NVK$
25. $\angle ENV$
26. $\angle EVK$



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Classifying Triangles

Classify the following triangles as acute/obtuse/right and scalene/isosceles/equilateral

1. 90°, 45°

2. 60°, 60°

3. 110°, 40°

4. 30°, 80°

5. 20°, 70°

6. 70°, 40°

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Types of Triangles with Algebra

1. In ΔABC, $m\angle A = 3x$, $m\angle B = 4x - 19$, and $m\angle C = 3x - 1$. Which statement is true? ΔABC *is*

(1) Isosceles (3) Acute

(2) Obtuse (4) Right

2. The angles of a triangle are in the ratio 2:2:5. The triangle must be:

(1) Scalene (3) Acute

(2) Right (4) Obtuse

3. The measures of the angles of a triangle are 7x + 6, 9x – 20, and 3x + 4. The triangle is:

(1) acute and scalene (3) obtuse and isosceles

(2) acute and isosceles (4) obtuse and scalene

4. The measure of the angles of a triangle are 5x + 2, 5x – 7, and 4x + 17. The triangle is:

(1) acute (3) isosceles

(2) right (4) obtuse

5. The measures of the angles of a triangle are x – 2, 5x + 13, and 3x – 2. The triangle is:
(1) isosceles (3) obtuse
(2) right (4) acute

6. The measure of the angles of a triangle are 7x + 9, 2x + 3, and 4x – 27. The triangle is:
(1) acute and scalene (3) isosceles and acute
(2) right and acute (4) obtuse and isosceles

7. In ΔABC, $m\angle A = 3x + 1$, $m\angle B = 4x - 17$, and $m\angle C = 5x - 20$. Which type of triangle is ΔABC?
1) right
2) scalene
3) isosceles
4) equilateral

8. Triangle *PQR* has angles that are in the ratio 2:3:5. Which type of triangle is $\triangle PQR$?
1) acute
2) isosceles
3) obtuse
4) right

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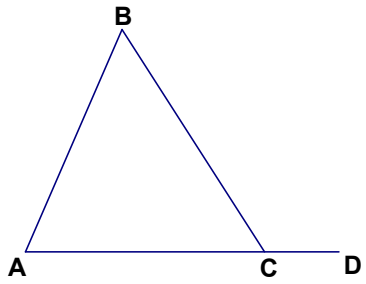
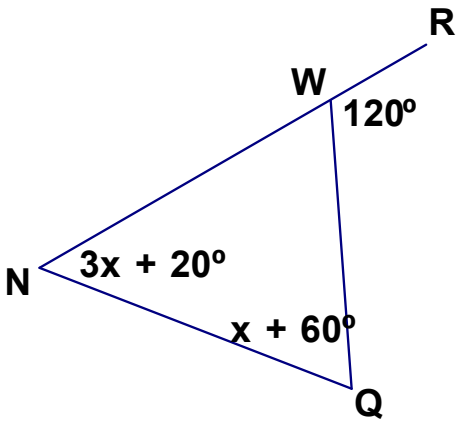
Exterior Angle Theorem

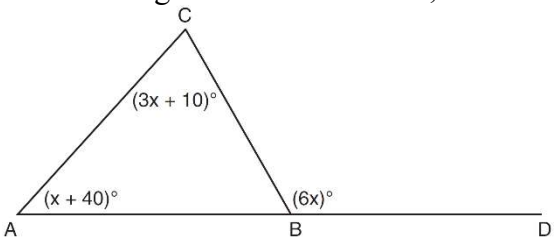
1. If m∠BCD = 110º and m∠ABC = 40º, find m∠BAC



2. Find the measure of ∠QNW below



3. In the diagram of ΔABC below, $\overline{AB}$ is extended to point D.

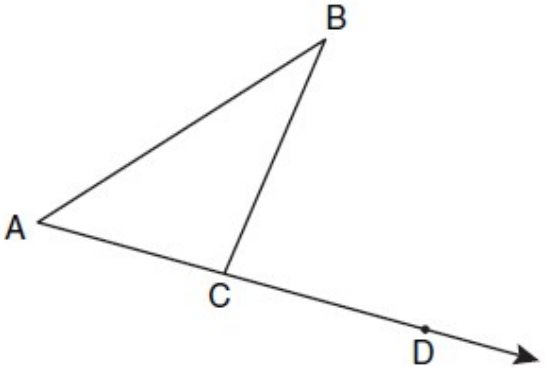


If $m\angle CAB = x + 40$, $m\angle ACB = 3x + 10$, $m\angle CBD = 6x$, what is $m\angle CAB$?

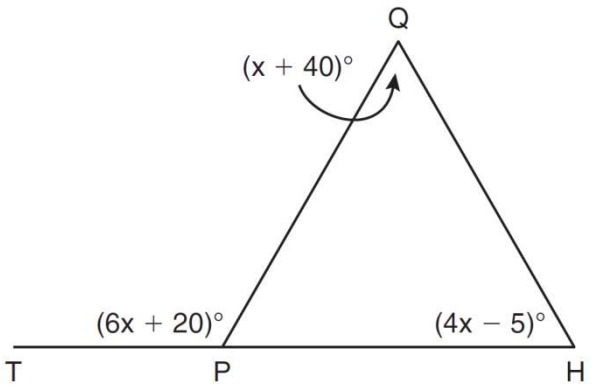
1) 13
2) 25
3) 53
4) 65

4. In the diagram below, $\triangle ABC$ is shown with $\overline{AC}$ extended through point D.

If $m\angle BCD = 6x+2$, $m\angle BAC = 3x+15$, and $m\angle ABC = 2x-1$, what is the value of x?



5. In the diagram below of $\triangle HQP$, side $\overline{HP}$ is extended through P to T, $m\angle QPT = 6x+20$, $m\angle HQP = x+40$, and $m\angle PHQ = 4x-5$. Find $m\angle QPT$.



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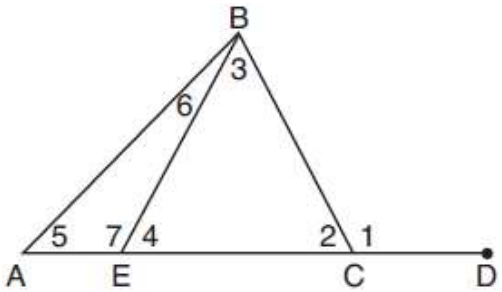
6. In the diagram below of triangle ABC, $\overline{AC}$ is extended through point C to point D, and $\overline{BE}$ is drawn to $\overline{AC}$.

Which equation is always true?

1) $m\angle 1 = m\angle 3 + m\angle 2$
2) $m\angle 5 = m\angle 3 - m\angle 2$
3) $m\angle 6 = m\angle 3 - m\angle 2$
4) $m\angle 7 = m\angle 3 + m\angle 2$



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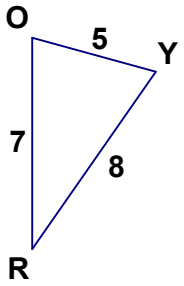
Corresponding Sides and Angles

1. What is the largest angle of ΔROY? What is the smallest angle of ΔROY?



2. In triangle SPY, $m\angle S = 35^{\circ}$ and $m\angle Y = 70^{\circ}$. What is the largest side of the triangle? What is the shortest side of the triangle?

3. In ΔABC, $m\angle A = 45°$ and $m\angle B = 60°$. What is the largest side of ΔABC ? What is the smallest side of ΔABC?

4. In ΔCAT, $m\angle C = 65$, and $m\angle A = 40$. Which side is the shortest? Which side is the longest?

5. In triangle TYL, $m\angle T = 71°$ and $m\angle Y = 42°$. What is the smallest side of the triangle? What is the largest side of the triangle?

6. In triangle LYS, $m\angle L = 48°$ and $m\angle Y = 101°$. What is the smallest side of the triangle? What is the largest side of the triangle?

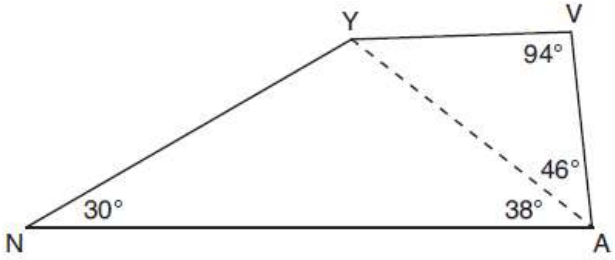
7. In ΔABC, $m\angle A = 60$, $m\angle B = 80$, and $m\angle C = 40$. Which inequality is true?

1) $AB > BC$
2) $AC > BC$
3) $AC < BA$
4) $BC < BA$

8. In the diagram of quadrilateral $NAVY$ below, $m\angle YNA = 30°$, $m\angle YAN = 38°$, $m\angle AVY = 94°$, and $m\angle VAY = 46°$.

Which segment has the shortest length?

1) $\overline{AY}$
2) $\overline{NY}$
3) $\overline{VA}$
4) $\overline{VY}$



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Triangle Inequality Theorem

1. Which of the following cannot make up the three sides of a triangle?

1) {3,5,4} 3) {9,7,5}
2) {2,2,3} 4) {6,1,4}

2. Which of the following can make up the three sides of a triangle?

1) {2,4,2} 3) {8,1,6}
2) {1,7,4} 4) {5,5,7}

3. Which numbers could represent the lengths of the sides of a triangle?
1) 5,9,14
2) 7,7,15
3) 1,2,4
4) 3,6,8

4. Which of the following cannot make up the three sides of a triangle?
1) {5,1,6} 3) {3,5,6}
2) {9,14,8} 4) {7,10,4}

5. Which set of numbers represents the lengths of the sides of a triangle?
1) {5, 18, 13} 3) {16, 24, 7}
2) {6, 17, 22} 4) {26, 8, 15}

6. Which of the following cannot make up the three sides of a triangle?
1) {3,9,7} 3) {8,12,15}
2) {2,7,5} 4) {9,3,7}

7. In ΔBLA, $\overline{BL} = 12$ and $\overline{AL} = 8$. What is the range of possible values of $\overline{BA}$?

8. In ΔCAM, $\overline{CM} = 10$ and $\overline{CA} = 4$. What is the range of possible values of $\overline{MA}$?

9. In $\triangle ABC$, $AB = 5$ feet and $BC = 3$ feet. Which inequality represents all possible values for the length of $\overline{AC}$, in feet?

1) $2 \leq AC \leq 8$
2) $2 < AC < 8$
3) $3 \leq AC \leq 7$
4) $3 < AC < 7$

10. Two sides of a triangle are 7 and 11. The third side of the triangle can measure:

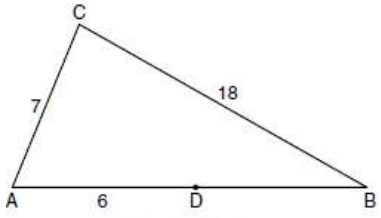
1) 4
2) 18
3) 8
4) 21

11. Jacquie is building a triangular fence for her tomato garden. She has an eight foot piece of fence and a four foot piece of fence. Which can be the length of the third piece of fence?

1) 2 feet
2) 5 feet
3) 4 feet
4) 12 feet

12. In the diagram below of $\triangle ABC$, D is a point on $\overline{AB}$, $AC = 7$, $AD = 6$, and $BC = 18$. The length of $\overline{DB}$ could be

1) 5
2) 12
3) 19
4) 25



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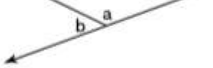
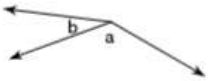
Angle Pairs: Linear Pairs, Complementary, Vertical

Determine whether the following pairs of angles are linear pairs, complementary, vertical, or neither.

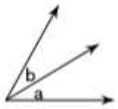
1)



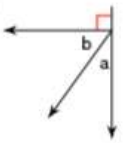
2)



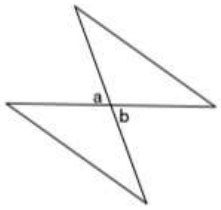
3)



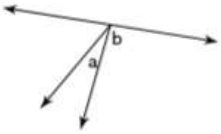
4)



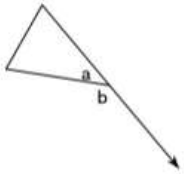
5)



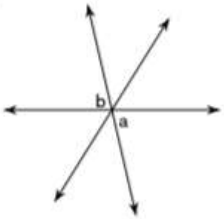
6)



7)

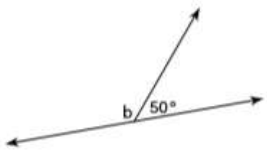


8)

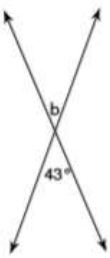


Find angle b in the following examples.

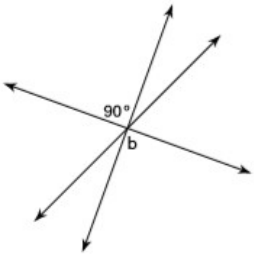
9)



10)



11)



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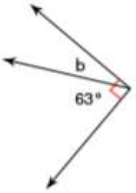

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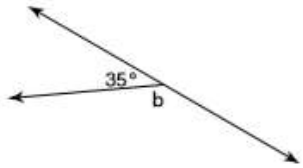

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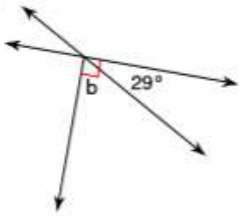
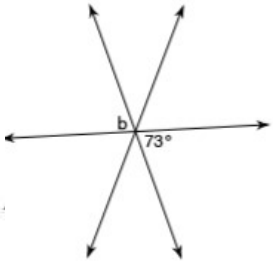
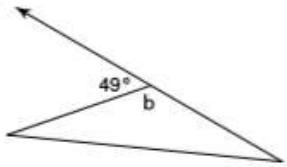


15)

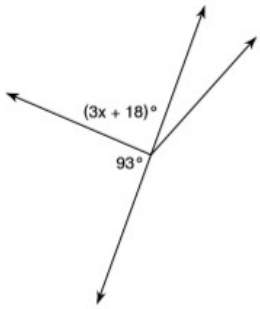


16)

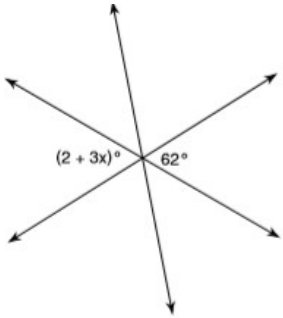


Find the value of x.

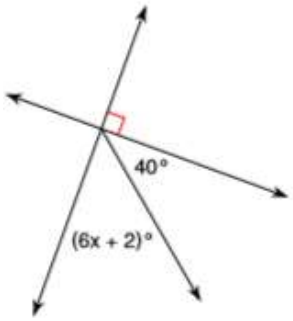
17)



18)



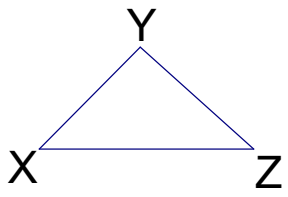
19)



Name _____ Date _____
Mr. Schlansky Geometry

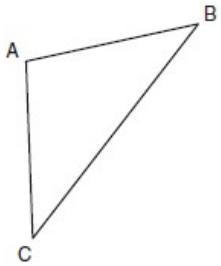
Isosceles Triangles, Angle Bisectors, and Equilateral Triangles

1. In ΔXYZ, $\overline{XY} \cong \overline{YZ}$. If $m\angle Z = 41°$, find the measure of $\angle Y$.



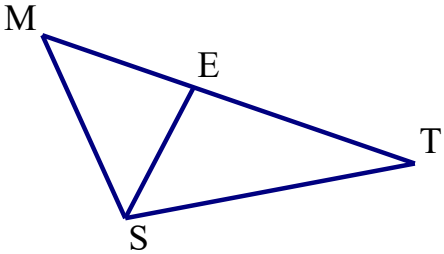
2. In ΔPQR, $\overline{PQ} \cong \overline{QR}$. If $m\angle PQR = 94°$, find the measure of $\angle QPR$.

3. In the diagram of $\triangle ABC$ below, $\overline{AB} \cong \overline{AC}$. The measure of $\angle B$ is 40°.
What is the measure of $\angle A$?

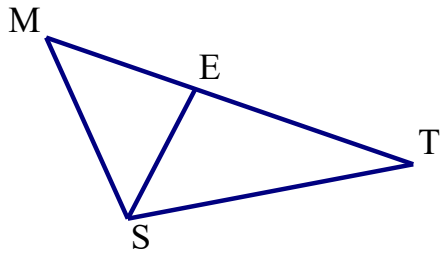


4. In $\triangle RST$, $m\angle RST = 46$ and $\overline{RS} \cong \overline{ST}$. Find $m\angle STR$.

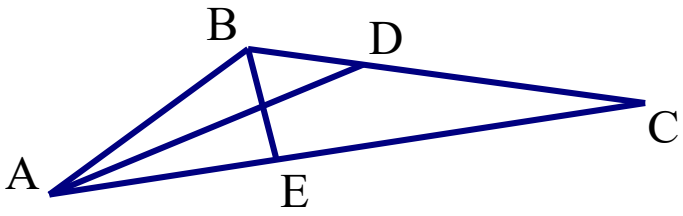
5. In the diagram below of ΔMST, $\overline{ES}$ bisects $\angle MST$. If $m\angle MST = 70$, find $\angle MSE$ and $\angle TSE$.



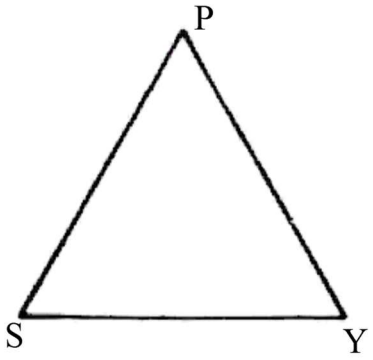
6. In the diagram below of ΔMST, $\overline{ES}$ bisects $\angle MST$. If $m\angle MSE = 40$, find $\angle TSE$ and $\angle TSM$.



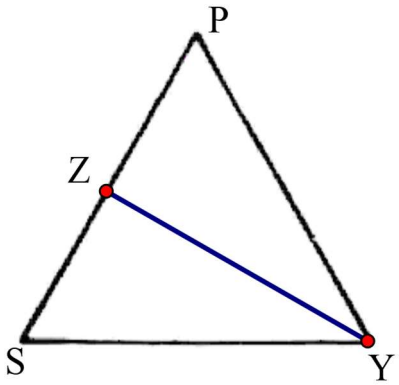
7. In the diagram below of ΔABC, $\overline{DA}$ bisects $\angle BAC$ and $\overline{BE}$ bisects $\angle ABC$. If $\angle BAD = 20$ and $\angle ABC = 100$, find $\angle CAD, \angle CAB, \angle ABE, \angle CBE$.



8. In the diagram below, ΔSPY is equilateral. Find the measure of $\angle S, \angle P, \angle Y$.



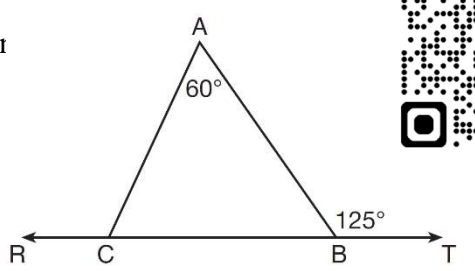
9. In the diagram below, ΔSPY is equilateral and $\overline{ZY}$ bisects $\angle PYS$. Find the measure of $\angle PYZ$.



Name _____ Date _____
Mr. Schlansky Geometry

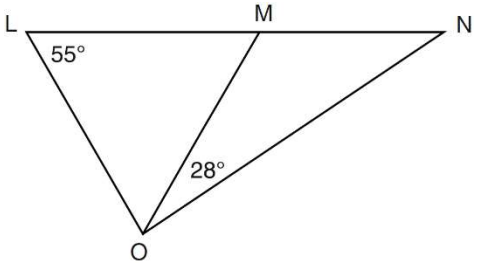
Complex Triangle Problems

1. In the diagram below, $\overleftrightarrow{RCBT}$ and $\triangle ABC$ are shown. What is $m\angle ACR$?
1) 125
2) 115
3) 65
4) 55

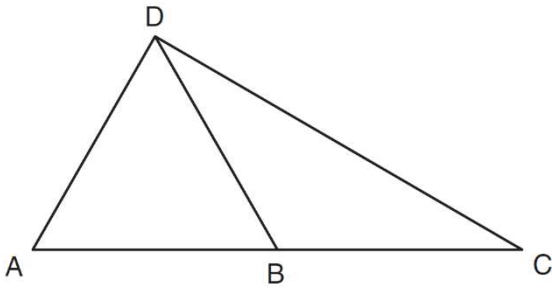


2. In the diagram below, $\triangle LMO$ is isosceles with $LO = MO$.

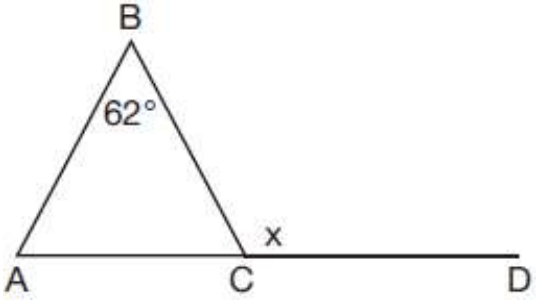
If $m\angle L = 55$ and $m\angle NOM = 28$, what is $m\angle N$?
1) 27
2) 28
3) 42
4) 70



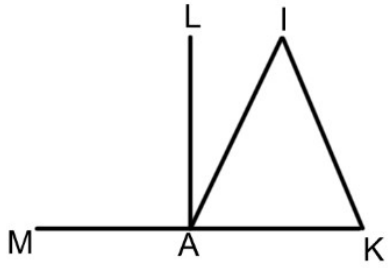
3. In the diagram below of $\triangle ACD$, B is a point on $\overline{AC}$ such that $\triangle ADB$ is an equilateral triangle, and $\triangle DBC$ is an isosceles triangle with $\overline{DB} \cong \overline{BC}$. Find $m\angle C$.



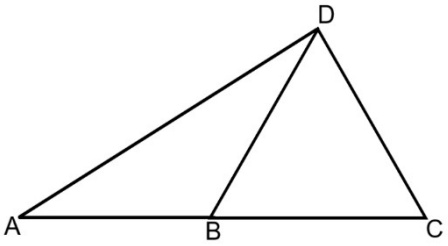
4. Given $\triangle ABC$ with $m\angle B = 62°$ and side $\overline{AC}$ extended to D, as shown below. Which value of x makes $\overline{AB} \cong \overline{CB}$?



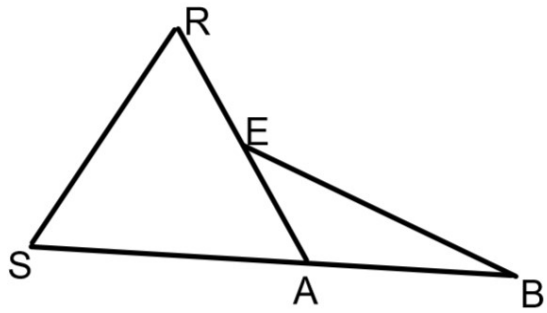
5. In the diagram below, $m\angle MAL = 90$, $m\angle IAL = 20$, and $\overline{IA} \cong \overline{AK}$. Find $m\angle I$.



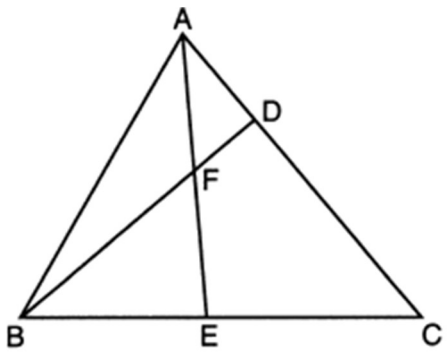
6. In the diagram below, ΔDBC is an equilateral triangle and $m\angle ADB = 25$. Find $m\angle DAB$



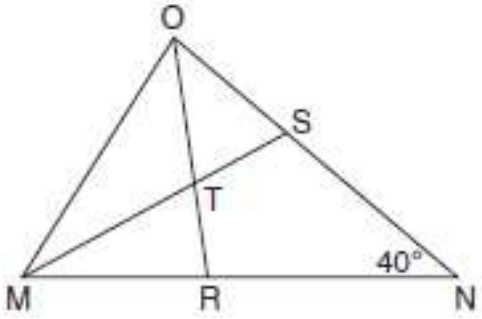
7. In the diagram below, $\overline{SR} \cong \overline{RA}$, $m\angle SRA = 40$, and $m\angle ABE = 30$. Find $m\angle BEA$.



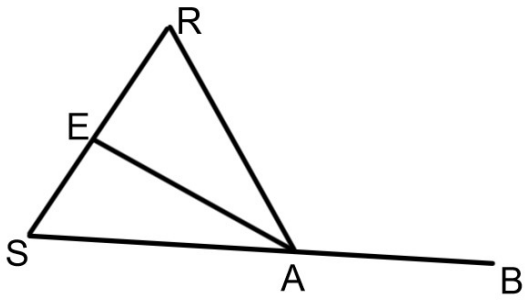
8. In the diagram of $\triangle ABC$ below, $\overline{AE}$ bisects angle BAC, and altitude $\overline{BD}$ is drawn. If $\text{m}\angle C = 50°$ and $\text{m}\angle ABC = 60°$, what is $\text{m}\angle FEB$?



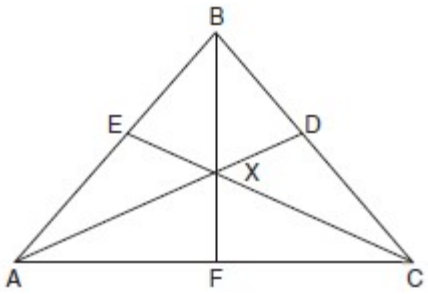
9. In the diagram below of triangle *MNO*, $\angle M$ and $\angle O$ are bisected by $\overline{MS}$ and $\overline{OR}$, respectively. Segments *MS* and *OR* intersect at *T*, and $m\angle N = 40°$. If $m\angle TMR = 28°$, what is the measure of angle *OTS*?



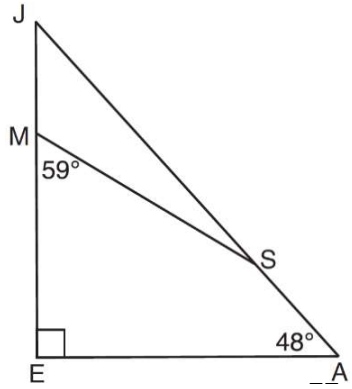
10. In the diagram below, $\overline{EA}$ bisects $\angle SAR$, $\overline{RA} \cong \overline{AS}$ and $m\angle SRA = 55$. Find and $m\angle RAB$ and $m\angle REA$.



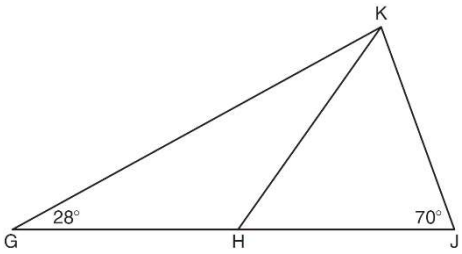
11. In the diagram below of isosceles triangle *ABC*, $\overline{AB} \cong \overline{CB}$ and angle bisectors $\overline{AD}$, $\overline{BF}$, and $\overline{CE}$ are drawn and intersect at *X*.
If $m\angle BAC = 50°$, find $m\angle AXC$.



12. In the diagram of $\triangle JEA$ below, $m\angle JEA = 90$ and $m\angle EAJ = 48$. Line segment *MS* connects points *M* and *S* on the triangle, such that $m\angle EMS = 59$.
What is $m\angle JSM$?



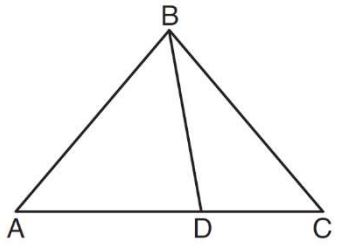
13. In the diagram below of $\triangle GJK$, H is a point on $\overline{GJ}$, $\overline{HJ} \cong \overline{JK}$, $m\angle G = 28$, and $m\angle GJK = 70$. Determine whether $\triangle GHK$ is an isosceles triangle and justify your answer.



14. In the diagram below, $m\angle BDC = 100°$, $m\angle A = 50°$, and $m\angle DBC = 30°$.

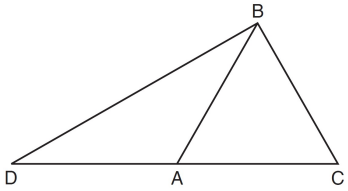
Which statement is true?

1) $\triangle ABD$ is obtuse.
2) $\triangle ABC$ is isosceles.
3) $m\angle ABD = 80°$
4) $\triangle ABD$ is scalene.



15. In the diagram of ΔBCD shown below, $\overline{BA}$ is drawn from vertex B to point A on $\overline{DC}$, such that $\overline{BC} \cong \overline{BA}$.

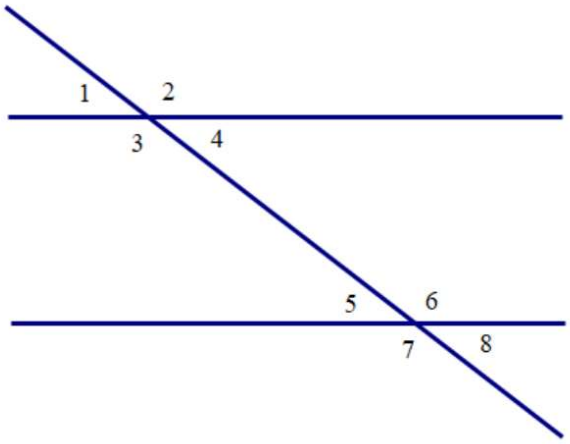
In ΔDAB, $m\angle D = x$, $m\angle DAB = 5x - 30$, and $m\angle DBA = 3x - 60$. In ΔABC, $AB = 6y - 8$ and $BC = 4y - 2$. [Only algebraic solutions can receive full credit.] Find $m\angle D$. Find $m\angle BAC$. Find the length of $\overline{BC}$. Find the length of $\overline{DC}$.



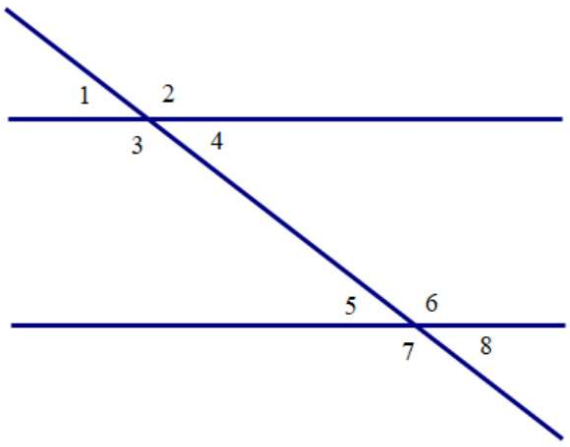
Name _____ Date _____
Mr. Schlansky Geometry

Parallel Lines Cut By a Transversal

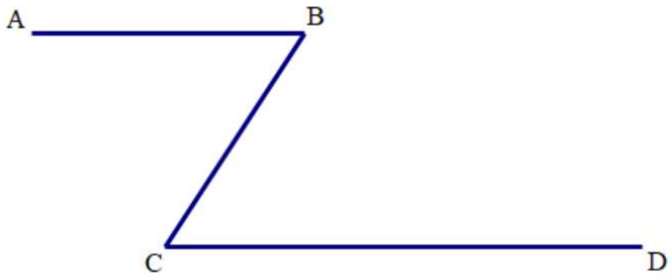
1. In the diagram below, two parallel lines are cut by a transversal. If $m\angle 1 = 60$, fill in the rest of the angles.



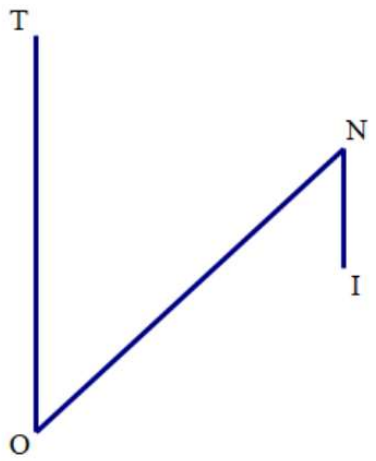
2. In the diagram below, two parallel lines are cut by a transversal. If $m\angle 2 = 100$, fill in the rest of the angles.



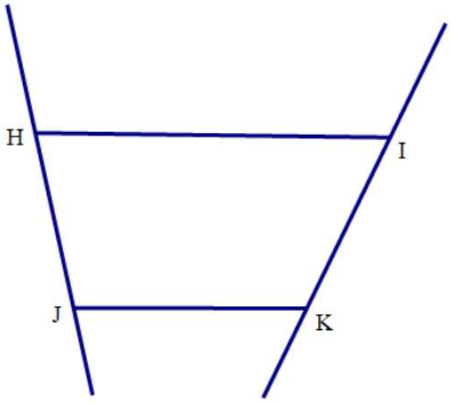
3. In the diagram below, $\overline{AB} \parallel \overline{CD}$. If $m\angle ABC = 40$, create and find 8 angles.



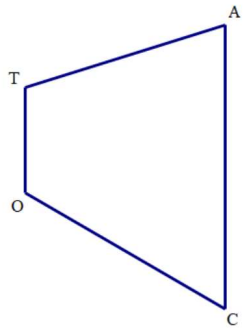
4. In the diagram below, $\overline{TO} \parallel \overline{NI}$. If $m\angle TON = 30$, create and find 8 angles.



5. In the diagram below, $\overline{HI} \parallel \overline{JK}$. If $m\angle HIK = 70$ and $m\angle HJK = 130$, create and find 16 angles.

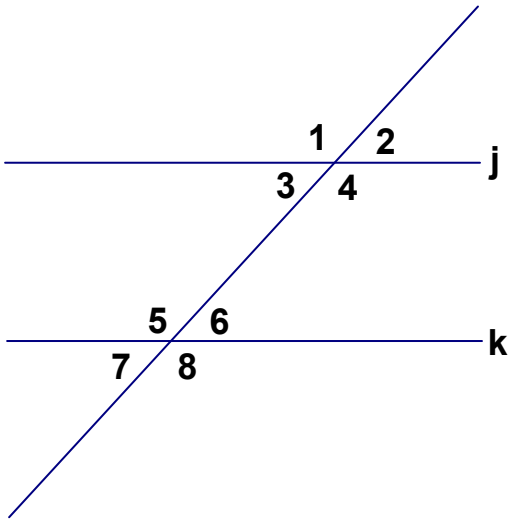


6. Trapezoid TACO has $\overline{TO} \parallel \overline{AC}$. If $m\angle TOC = 120$ and $m\angle TAC = 40$, create and find 16 angles.



7. In figure 1, if j || k, which of the following must be true?
(1) $\angle 1 \cong \angle 2$ (3) $\angle 2 \cong \angle 4$
(2) $\angle 1$ is supplementary to $\angle 5$ (4) $\angle 3 \cong \angle 6$

Figure 1

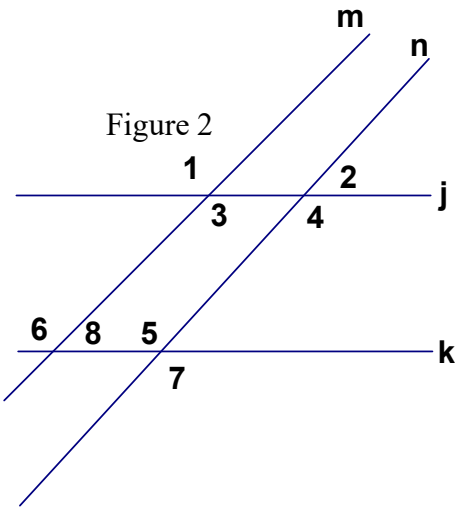


8. In figure 1, if j || k, which of the following must be true?
(1) $\angle 1$ is supplementary to $\angle 7$ (3) $\angle 6 \cong \angle 8$
(2) $\angle 1$ is supplementary to $\angle 4$ (4) $\angle 5 \cong \angle 2$

9. In figure 1, if j || k, which of the following must be true?
(1) $\angle 5$ is supplementary to $\angle 4$ (3) $\angle 6 \cong \angle 4$
(2) $\angle 2$ is supplementary to $\angle 3$ (4) $\angle 5 \cong \angle 4$

10. In figure 2, if $\angle 1 \cong \angle 4$, which of the following must be true?
(1) j || k (3) m || n
(2) $\angle 5 \cong \angle 8$ (4) m not || to n

Figure 2

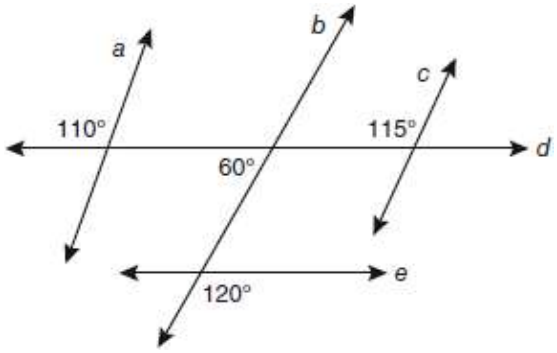


11. In figure 2, if $\angle 7$ is not supplementary to $\angle 2$, which of the following *must* be true?
(1) j || k (3) m || n
(2) j not || to k (4) m not || to n

12. In figure 2, if $\angle 4$ *not* $\cong \angle 1$, which of the following must be true?
(1) j || k (3) m || n
(2) j not || to k (4) m not || to n

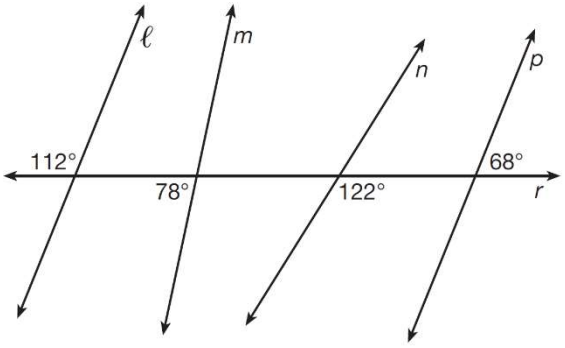
13. Based on the diagram below, which statement is true?

1) $a \parallel b$
2) $a \parallel c$
3) $b \parallel c$
4) $d \parallel e$



14. In the diagram below, lines ℓ, m, n, and p intersect line r.
Which statement is true?

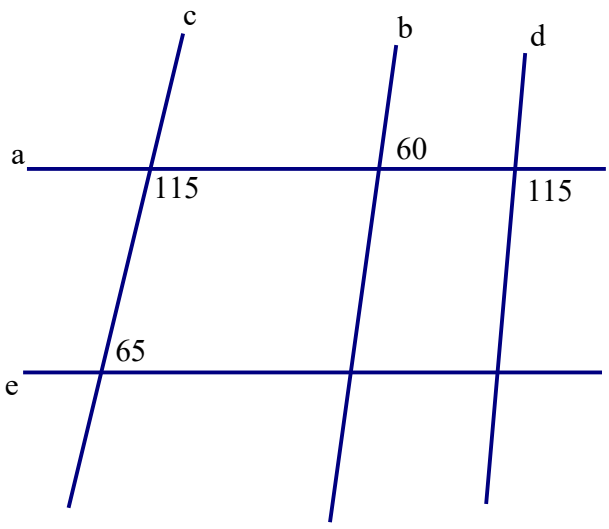
1) $\ell \parallel n$
2) $\ell \parallel p$
3) $m \parallel p$
4) $m \parallel n$



15. Which of the following statements are true?

I: $a \parallel e$
II: $c \parallel b$
III: $c \parallel d$
IV: $b \parallel d$

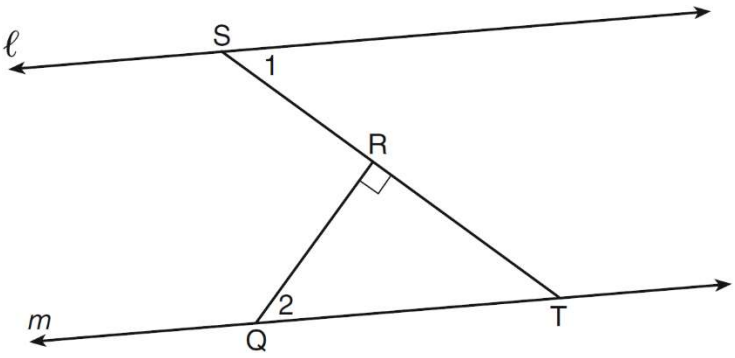
1) I only
2) II only
3) I and III only
4) II and IV only



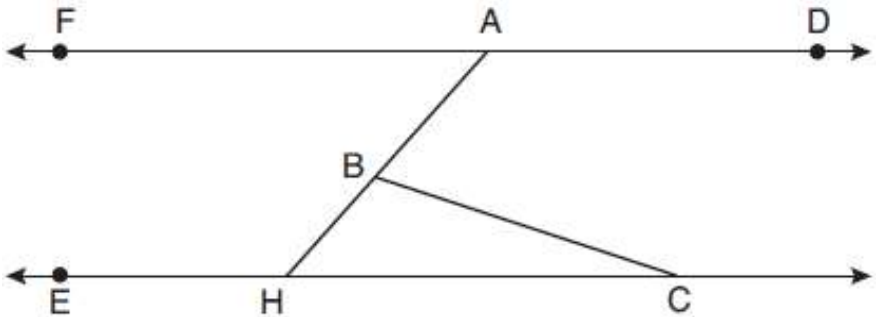
Name _____ Date _____
Mr. Schlansky Geometry

Parallel Lines With Triangles

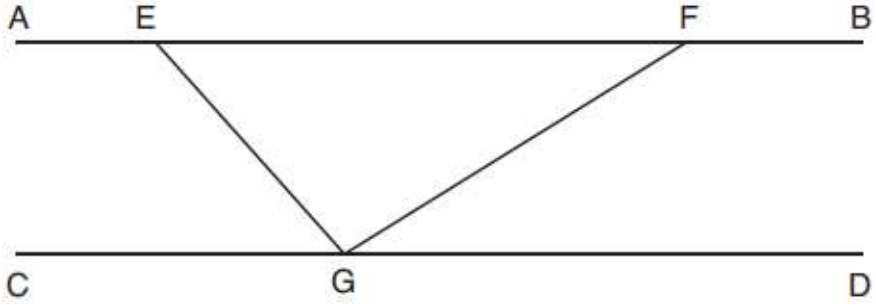
1. In the diagram below, $\ell \parallel m$ and $\overline{QR} \perp \overline{ST}$
If $m\angle 1 = 63$, find $m\angle 2$.



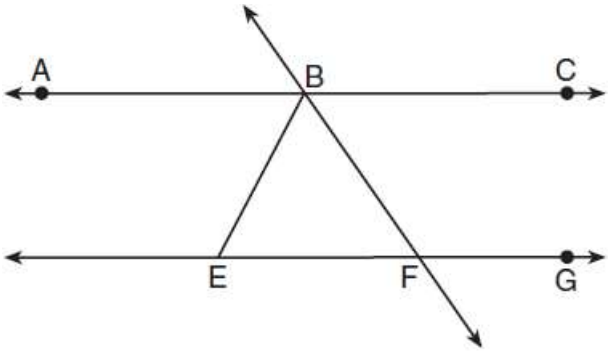
2. In the diagram below, $\overline{FAD} \parallel \overline{EHC}$, and $\overline{ABH}$ and $\overline{BC}$ are drawn. If $m\angle FAB = 48°$ and $m\angle ECB = 18°$, what is $m\angle ABC$?



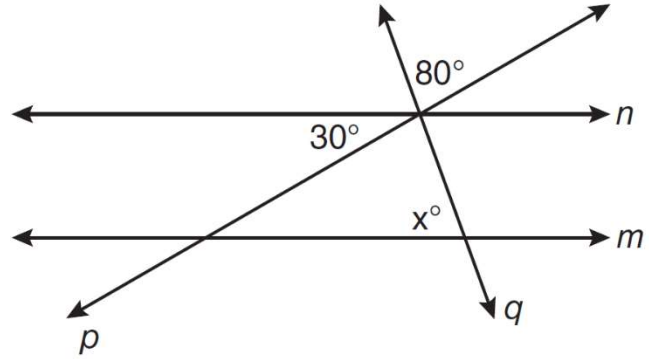
3. In the diagram below, $\overline{AEFB} \parallel \overline{CGD}$, and $\overline{GE}$ and $\overline{GF}$ are drawn.
If $m\angle EFG = 32°$ and $m\angle CGE = 43$, what is $m\angle EGF$?



4. As shown in the diagram below, $\overleftrightarrow{ABC} \parallel \overleftrightarrow{EFG}$ and $\overline{BF} \cong \overline{EF}$.
If $m\angle CBF = 42.5°$, find $m\angle EBF$.

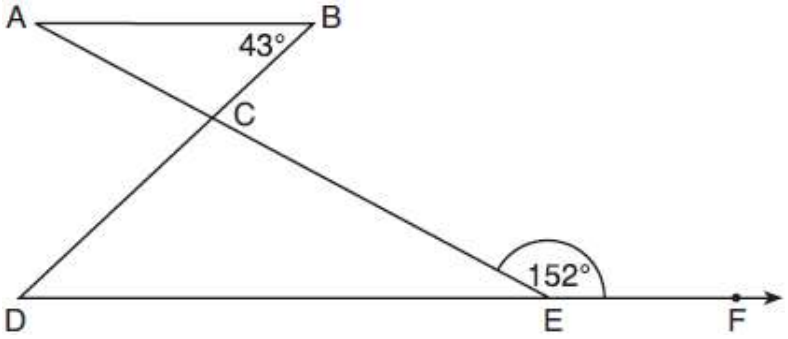


5. In the diagram below, lines *n* and *m* are cut by transversals *p* and *q*.
What value of *x* would make lines *n* and *m* parallel?

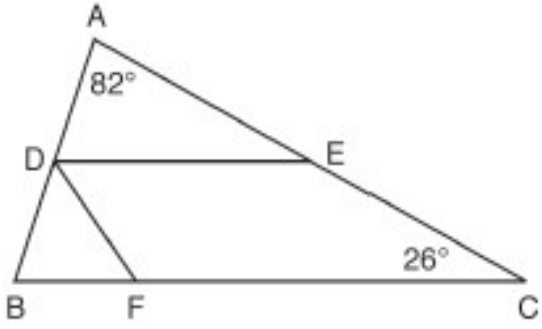


6. In the diagram below, $\overline{AB} \parallel \overrightarrow{DEF}$, $\overline{AE}$ and $\overline{BD}$ intersect at *C*, $m\angle B = 43°$, and $m\angle CEF = 152°$.
Which statement is true?

1) $m\angle D = 28°$
2) $m\angle A = 43°$
3) $m\angle ACD = 71°$
4) $m\angle BCE = 109°$



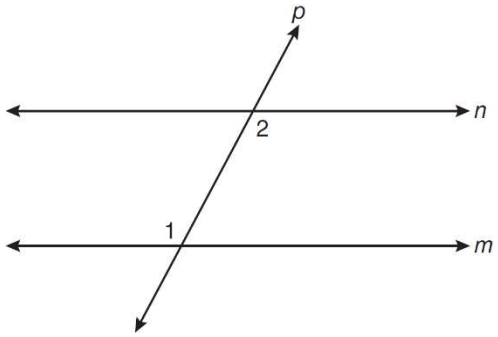
7. In the diagram below, $\overline{DE}$ divides $\overline{AB}$ and $\overline{AC}$ proportionally, $m\angle C = 26°$, $m\angle A = 82°$, and $\overline{DF}$ bisects $\angle BDE$. What is the measure of angle DFB?



Name _____ Date _____
Mr. Schlansky Geometry

Parallel Lines Cut By a Transversal with Algebra

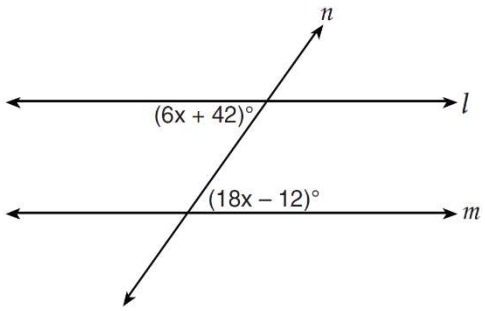
1. In the diagram below, line *p* intersects line *m* and line *n*.



If $m\angle 1 = 7x$ and $m\angle 2 = 5x + 30$, lines *m* and *n* are parallel when *x* equals

1) 12.5
2) 15
3) 87.5
4) 105

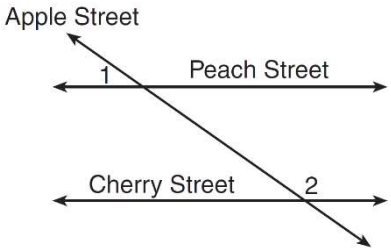
2. Line *n* intersects lines *l* and *m*, forming the angles shown in the diagram below.



Which value of *x* would prove $l \parallel m$?

1) 2.5
2) 4.5
3) 6.25
4) 8.75

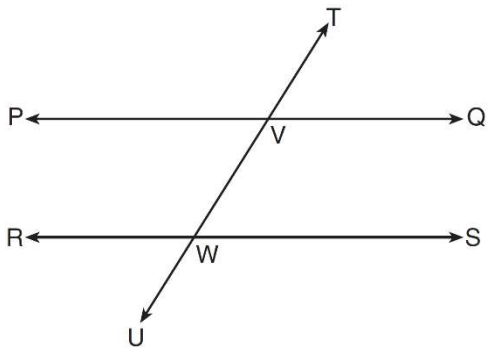
3. Peach Street and Cherry Street are parallel. Apple Street intersects them, as shown in the diagram below.



If $m\angle 1 = 2x + 36$ and $m\angle 2 = 7x - 9$, what is $m\angle 1$?

1) 9
2) 17
3) 54
4) 70

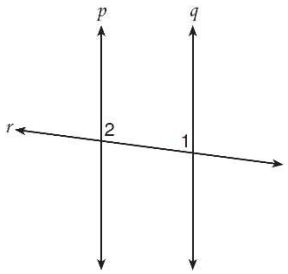
4. In the diagram below, transversal $\overleftrightarrow{TU}$ intersects $\overleftrightarrow{PQ}$ and $\overleftrightarrow{RS}$ at V and W, respectively.



If $m\angle TVQ = 5x - 22$ and $m\angle VWS = 3x + 10$, for which value of x is $\overleftrightarrow{PQ} \parallel \overleftrightarrow{RS}$?

1) 6
2) 16
3) 24
4) 28

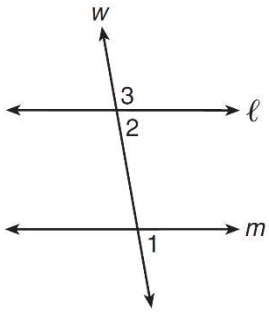
5. Lines p and q are intersected by line r, as shown below.



If $m\angle 1 = 7x - 36$ and $m\angle 2 = 5x + 12$, for which value of x would $p \parallel q$?

1) 17
2) 24
3) 83
4) 97

6. In the diagram below, line ℓ is parallel to line m, and line w is a transversal.



(Not drawn to scale)

If $m\angle 2 = 3x + 17$ and $m\angle 3 = 5x - 21$, what is $m\angle 1$?

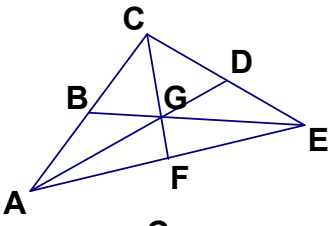
1) 19
2) 23
3) 74
4) 86

Name _____ Date _____

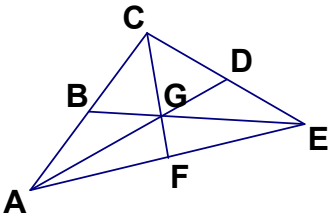
Mr. Schlansky Geometry

Intersecting Medians (Centroid Problems)

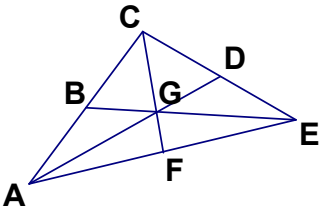
1. In the given triangle, all three medians are drawn in. If $\overline{AG} = 10$, find
   a) $\overline{GD}$
   b) $\overline{AD}$



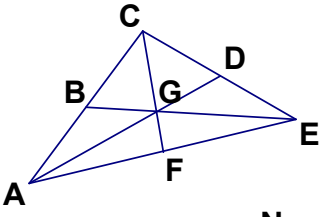
2. In the given triangle, all three medians are drawn in. If $\overline{FG} = 4$, find
   a) $\overline{CG}$
   b) $\overline{CF}$



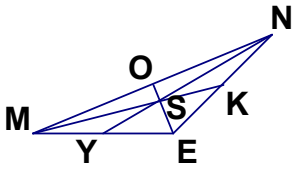
3. In the given triangle, all three medians are drawn in. If $\overline{AD} = 24$, find
   a) $\overline{AG}$
   b) $\overline{DG}$



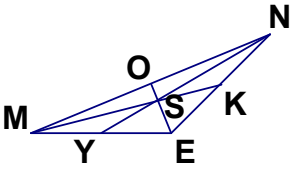
4. In the given triangle, all three medians are drawn in. If $\overline{AC} = 30$, find
   a) $\overline{AB}$
   b) $\overline{BC}$



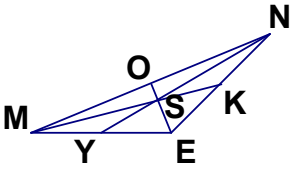
5. In the given triangle, all three medians are drawn in. If $\overline{MS} = 12$, find
   a) $\overline{SK}$
   b) $\overline{MK}$



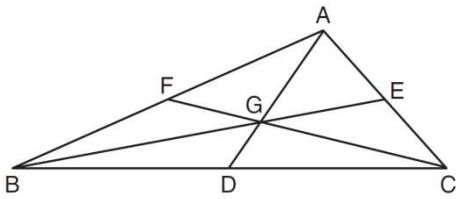
6. In the given triangle, all three medians are drawn in. If $\overline{OE} = 9$, find
   a) $\overline{OS}$
   b) $\overline{SE}$



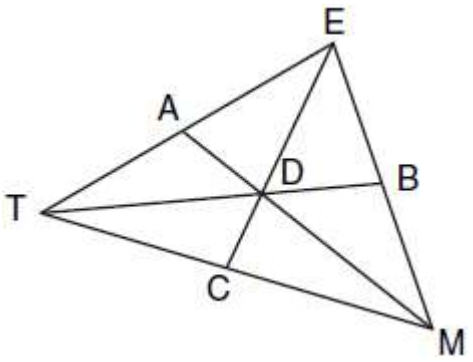
7. In the given triangle, all three medians are drawn in. If $\overline{YN} = 30$, find
   a) $\overline{YS}$
   b) $\overline{SN}$



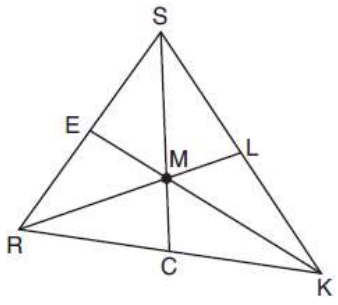
8. In the diagram below of $\triangle ABC$, medians $\overline{AD}$, $\overline{BE}$, and $\overline{CF}$ intersect at *G*. If $CF = 24$, what is the length of $\overline{FG}$?



9. In the diagram below of $\triangle TEM$, medians $\overline{TB}$, $\overline{EC}$, and $\overline{MA}$ intersect at *D*, and $TB = 9$. Find the length of $\overline{TD}$.



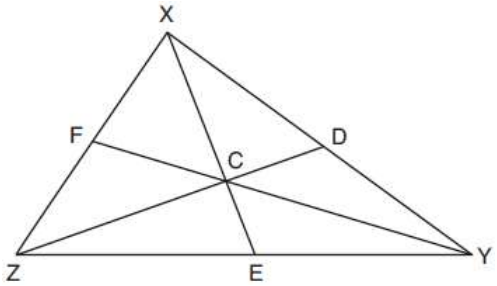
10. In triangle *SRK* below, medians $\overline{SC}$, $\overline{KE}$, and $\overline{RL}$ intersect at *M*.



Which statement must always be true?

1) $3(MC) = SC$
2) $MC = \frac{1}{3}(SM)$
3) $RM = 2MC$
4) $SM = KM$

11. In $\triangle XYZ$, shown below, medians $\overline{XE}$, $\overline{YF}$, and $\overline{ZD}$ intersect at *C*. If $CE = 5$, $YF = 21$, and $XZ = 15$, determine and state the perimeter of triangle *CFX*.



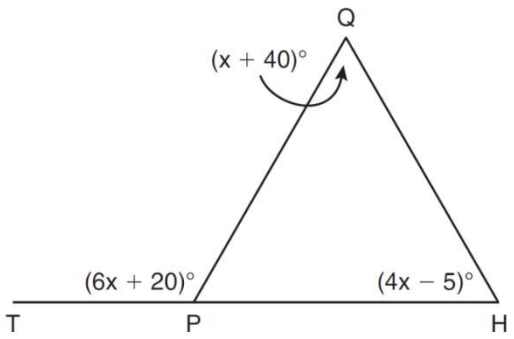
Name _____ Date _____
Mr. Schlansky Geometry

Triangles/Parallel Lines Review Sheet

1. In ΔABC, $m\angle A = 3x + 1$, $m\angle B = 4x - 17$, and $m\angle C = 5x - 20$. Which type of triangle is ΔABC?
1) right
2) scalene
3) isosceles
4) equilateral

2. Triangle *PQR* has angles that are in the ratio 2:3:5. Which type of triangle is $\triangle PQR$?
1) acute
2) isosceles
3) obtuse
4) right

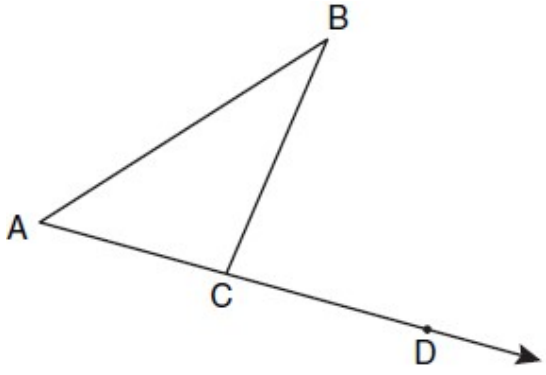
3. In the diagram below of $\triangle HQP$, side $\overline{HP}$ is extended through *P* to *T*, $m\angle QPT = 6x + 20$, $m\angle HQP = x + 40$, and $m\angle PHQ = 4x - 5$. Find $m\angle QPT$.



(Not drawn to scale)

4. In the diagram below, $\triangle ABC$ is shown with $\overline{AC}$ extended through point *D*.

If $m\angle BCD = 6x + 2$, $m\angle BAC = 3x + 15$, and $m\angle ABC = 2x - 1$, what is the value of *x*?



5. In triangle SPY, $m\angle S = 35^\circ$ and $m\angle Y = 70^\circ$. What is the largest side of the triangle? What is the shortest side of the triangle?

6. In ΔABC, $m\angle A = 45°$ and $m\angle B = 60°$. What is the largest side of ΔABC ? What is the smallest side of ΔABC?

7. Which set of numbers represents the lengths of the sides of a triangle?

1) $\{5, 18, 13\}$
2) $\{6, 17, 22\}$
3) $\{16, 24, 7\}$
4) $\{26, 8, 15\}$

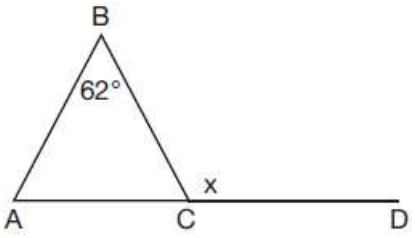
8. Which of the following cannot make up the three sides of a triangle?

1) {3,9,7}
2) {2,7,5}
3) {8,12,15}
4) {9,3,7}

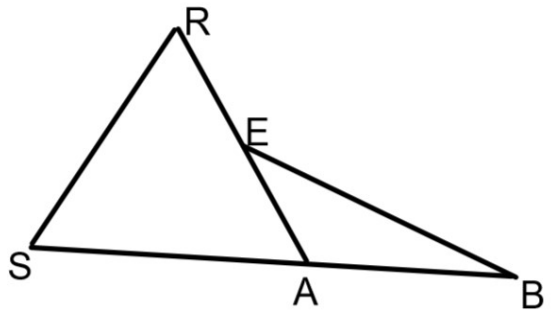
9. Given $\triangle ABC$ with $m\angle B = 62^\circ$ and side $\overline{AC}$ extended to D, as shown below.

Which value of x makes $\overline{AB} \cong \overline{CB}$?

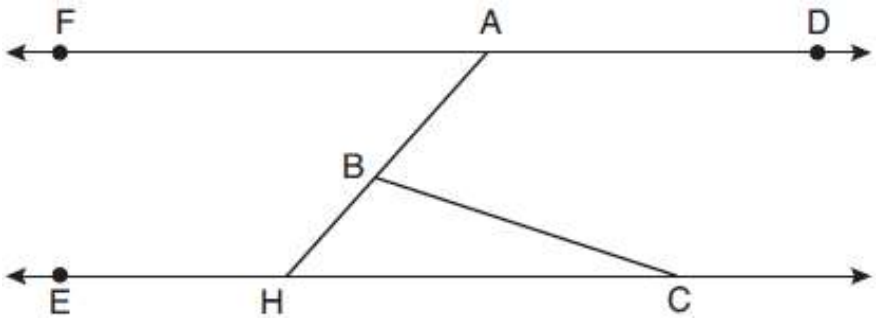
1) 59°
2) 62°
3) 118°
4) 121°



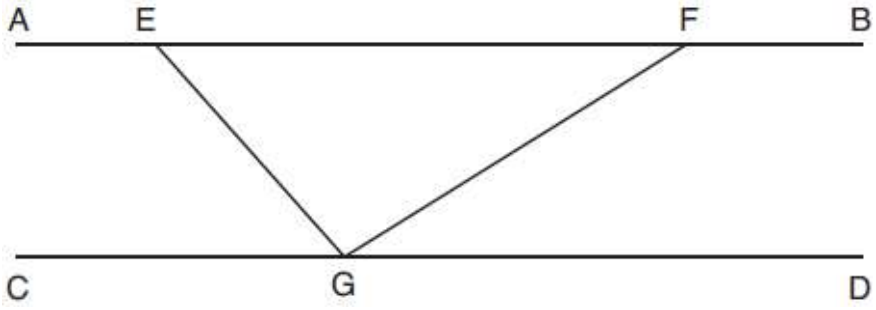
10. In the diagram below, $\overline{SR} \cong \overline{RA}$, $m\angle SRA = 40$, and $m\angle ABE = 30$. Find $m\angle BEA$.



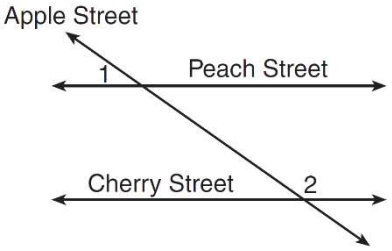
11. In the diagram below, $\overline{FAD} \parallel \overline{EHC}$, and $\overline{ABH}$ and $\overline{BC}$ are drawn. If $m\angle FAB = 48°$ and $m\angle ECB = 18°$, what is $m\angle ABC$?



12. In the diagram below, $\overline{AEFB} \parallel \overline{CGD}$, and $\overline{GE}$ and $\overline{GF}$ are drawn. If $m\angle EFG = 32°$ and $m\angle CGE = 43$, what is $m\angle EGF$?



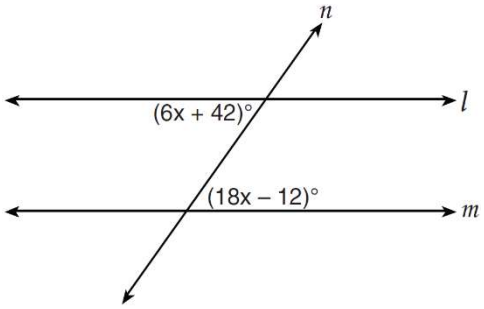
13. Peach Street and Cherry Street are parallel. Apple Street intersects them, as shown in the diagram below.



If $m\angle 1 = 2x + 36$ and $m\angle 2 = 7x - 9$, what is $m\angle 1$?

1) 9
2) 17
3) 54
4) 70

14. Line *n* intersects lines *l* and *m*, forming the angles shown in the diagram below.



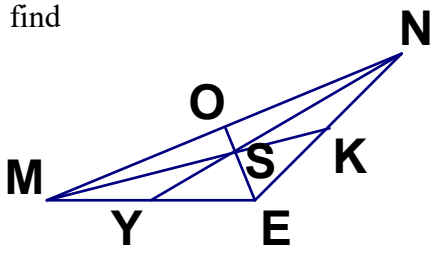
Which value of *x* would prove $l \parallel m$?

1) 2.5
2) 4.5
3) 6.25
4) 8.75

15. In the given triangle, all three medians are drawn in. If $\overline{MS} = 12$, find

c) $\overline{SK}$

d) $\overline{MK}$



16. In the given triangle, all three medians are drawn in. If $\overline{OS} = 9$, find

c) $\overline{ES}$

d) $\overline{OE}$