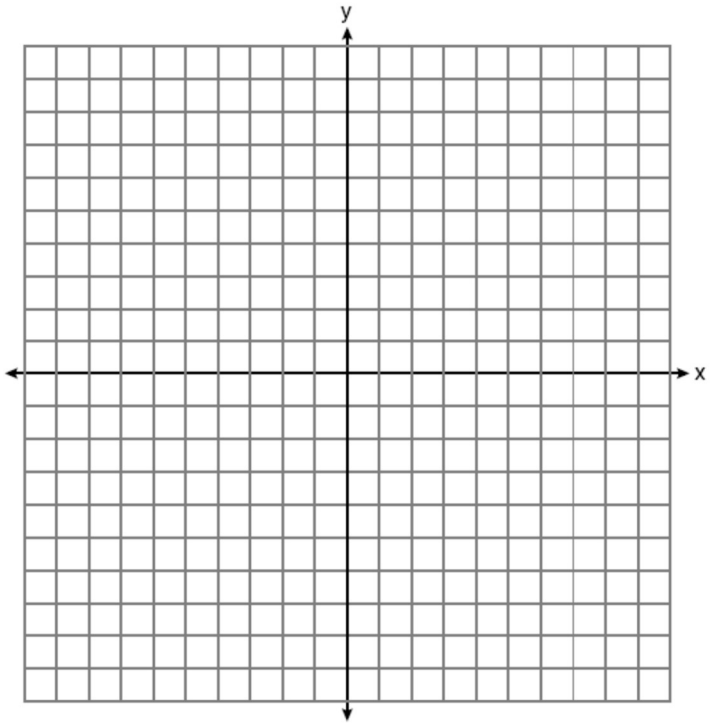
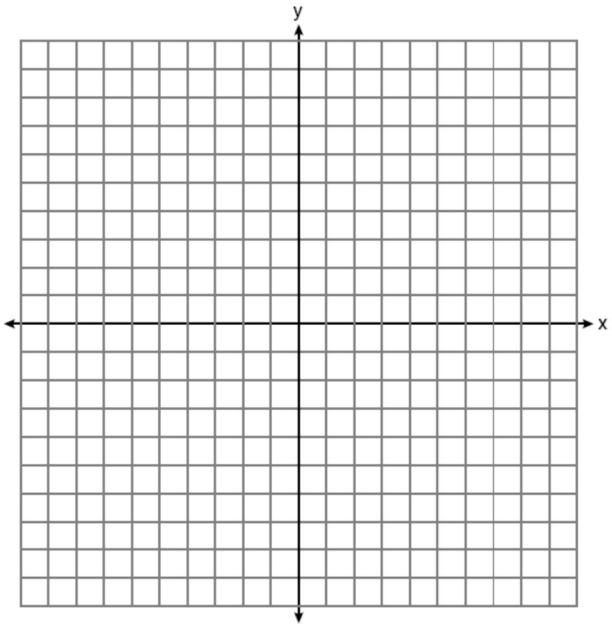
Name _____ Date _____
Mr. Schlansky Geometry

# *CCG Regents Review Test*

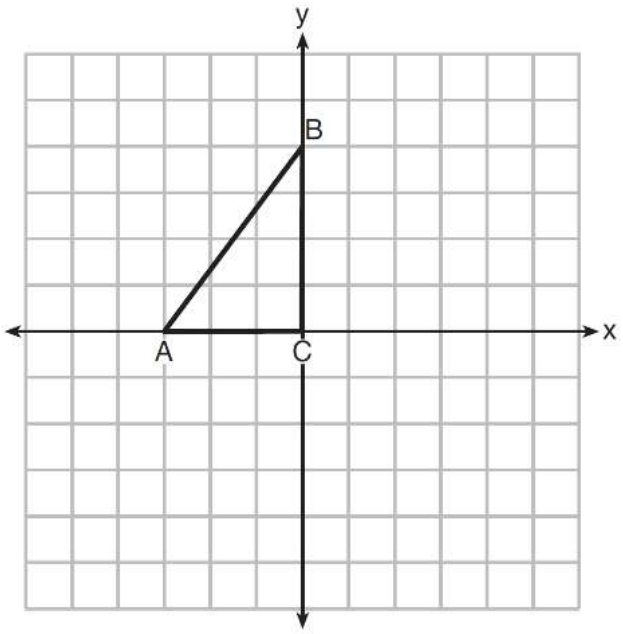
1. The coordinates of the vertices of $\triangle RST$ are $R(-2,3)$, $S(4,4)$, and $T(2,-2)$. Graph $\triangle RST$ and $\triangle R'S'T'$, the image of $\triangle RST$ after a dilation of 3 centered at (1,2).



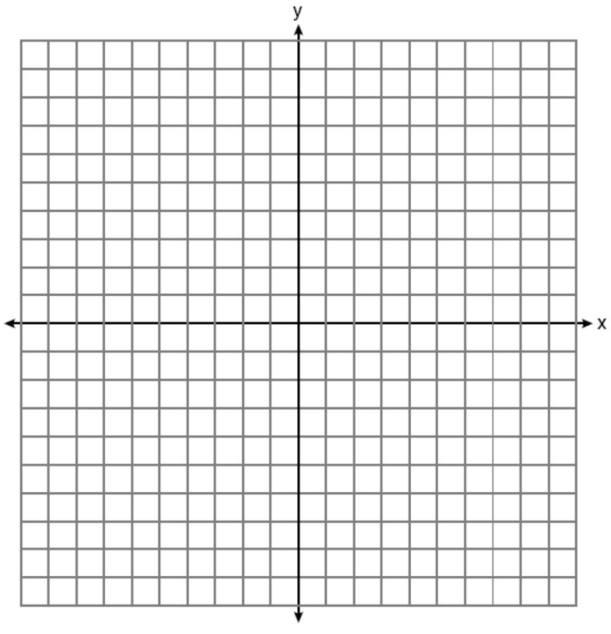

2. Triangle *SUN* has coordinates *S*(0,4), *U*(3,5), and *N*(3,0). On the accompanying grid, draw and label $\triangle SUN$. Then, graph and state the coordinates of $\triangle S'U'N'$, the image of $\triangle SUN$ after a dilation of 2 centered at the origin.



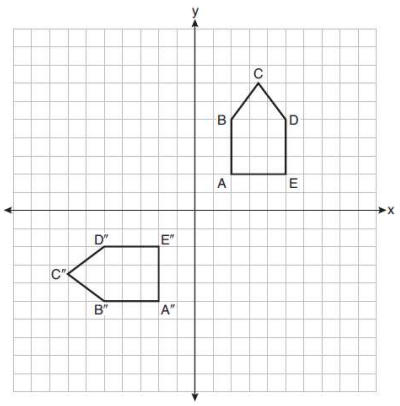
3. Triangle $ABC$ is graphed on the set of axes below. Graph and label $\triangle A'B'C'$, the image of $\triangle ABC$ after a reflection over the line $y = -1$.




4. The coordinates of the vertices of $\triangle RST$ are $R(-2, 3)$, $S(4, 4)$, and $T(2, -2)$. Graph $\triangle RST$. Graph and label $\triangle R'S'T'$, the image of $\triangle RST$ after a counter-clockwise rotation of 90 centered at the origin.



5. On the set of axes below, pentagon *ABCDE* is congruent to *A"B"C"D"E"*. Which describes a sequence of rigid motions that maps *ABCDE* onto *A"B"C"D"E"*?



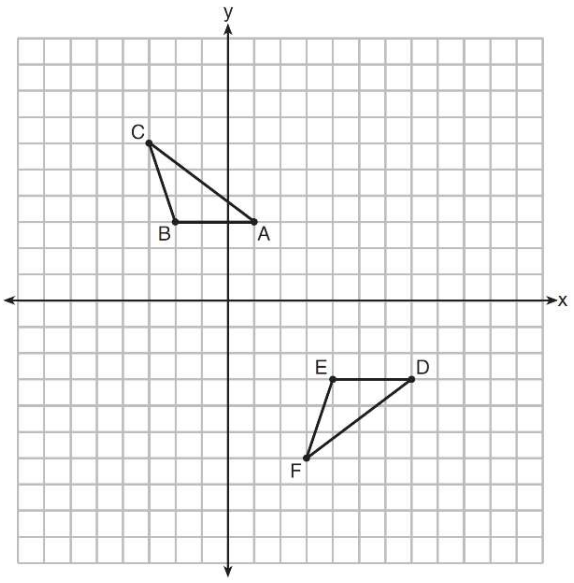

1) a rotation of 90° counterclockwise about the origin followed by a reflection over the *x*-axis
2) a rotation of 90° counterclockwise about the origin followed by a translation down 7 units
3) a reflection over the *y*-axis followed by a reflection over the *x*-axis
4) a reflection over the *x*-axis followed by a rotation of 90° counterclockwise about the origin

6. Under which transformation would $\triangle A'B'C'$, the image of $\triangle ABC$, *not* be congruent to $\triangle ABC$?

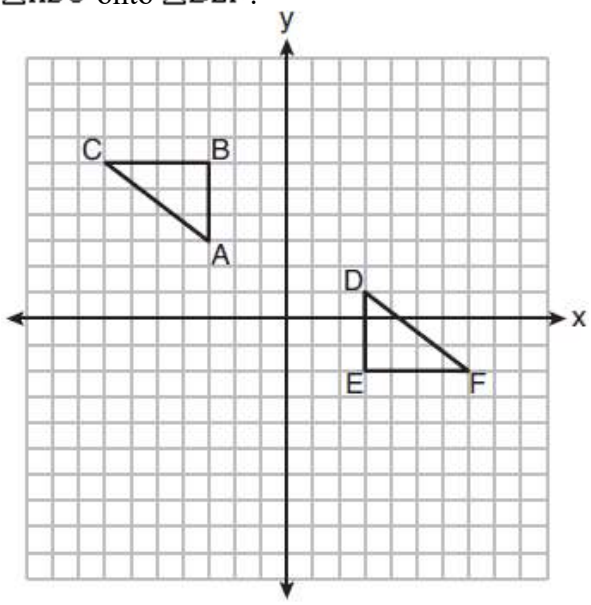
1) reflection over the *y*-axis
2) rotation of 90° clockwise about the origin
3) translation of 3 units right and 2 units down
4) dilation with a scale factor of 2 centered at the origin

7. Triangle DEF is the image of Triangle ABC after a clockwise rotation of 100 degrees centered at (-1,5). Are the triangles congruent? Use properties of rigid motions to explain your answer.

8. Describe a sequence of transformations that will map $\triangle ABC$ onto $\triangle DEF$ as shown below.



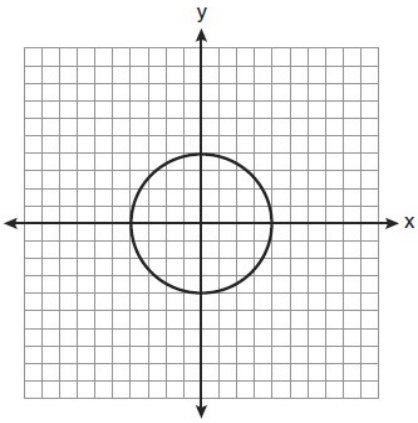
9. On the set of axes below, $\triangle ABC \cong \triangle DEF$. Describe a sequence of rigid motions that maps $\triangle ABC$ onto $\triangle DEF$.




10. Which rotation about its center will carry a regular octagon onto itself?

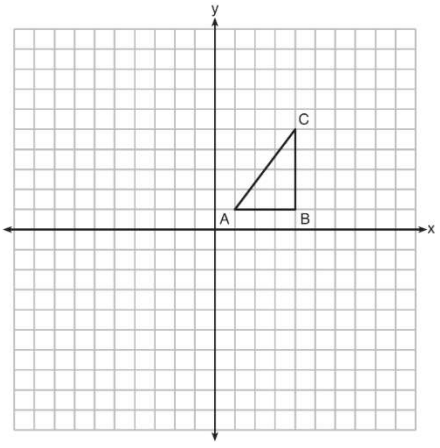
1) 80°
2) 315°
3) 280°
4) 120°

11. In the diagram below, which transformation does *not* map the circle onto itself?

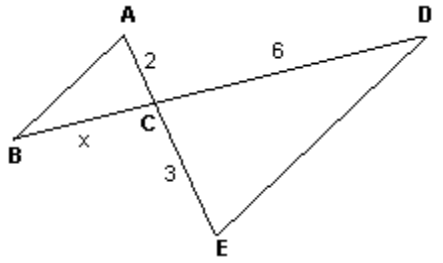



1) Rotation of 80 centered at the origin
2) Reflection over the line $y = x$
3) Rotation of 180 centered at (4,0)
4) Reflection over the line $x = 0$

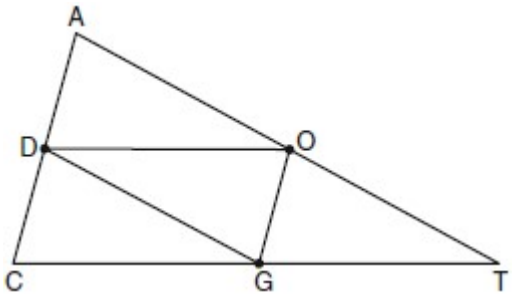
12. In the diagram below, $\triangle ABC$ has coordinates $A(1,1)$, $B(4,1)$, and $C(4,5)$. The coordinates of its image after a sequence of transformations is $A'(-9,-2), B'(-3,-2), \text{ and } C'(-3,6)$. What is the scale factor?



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



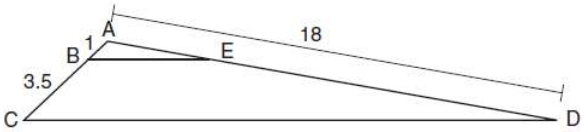

14. In the diagram below of $\triangle ACT$, $D$ is the midpoint of $\overline{AC}$, $O$ is the midpoint of $\overline{AT}$, and $G$ is the midpoint of $\overline{CT}$. If $AC = 10$, $AT = 18$, and $CT = 22$, what is the perimeter of parallelogram $CDOG$?




15. 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 $x$?

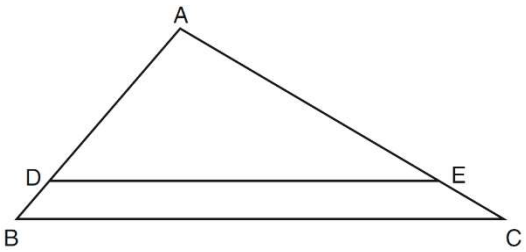
1) 6
2) 7
3) 9
4) 12

16. 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 $AD = 18$.

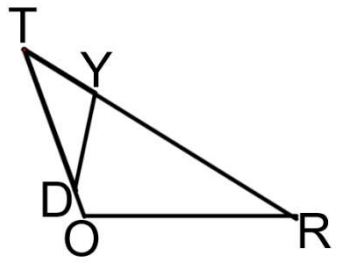



What is the length of $\overline{AE}$, to the *nearest tenth*?

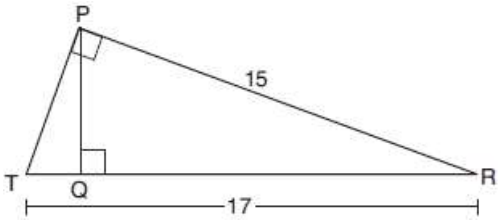
17. In the diagram of $\triangle ABC$ shown below, $\overline{DE} \parallel \overline{BC}$.
If $\overline{AE} = 6$, $\overline{DE} = 10$, and $\overline{EC} = 3$, find $\overline{BC}$




18. 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 $\overline{TO}$.



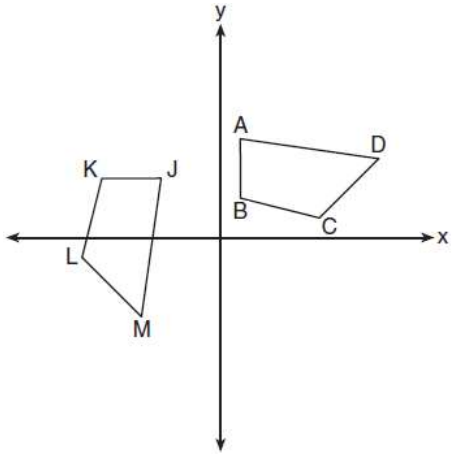

19. In right triangle *PRT*, $m\angle P = 90°$, altitude $\overline{PQ}$ is drawn to hypotenuse $\overline{RT}$, $RT = 17$, and $PR = 15$. Determine and state, to the *nearest tenth*, the length of $\overline{RQ}$.




20. In the diagram below, a sequence of rigid motions maps *ABCD* onto *JKLM*.

Which of the following statements must be true?

1) $\angle L \cong \angle B$
2) $\angle A \cong \angle J$
3) $\overline{JK} \cong \overline{AC}$
4) $\overline{JM} \cong \overline{AB}$



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

22. 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 $\overline{CT}$.

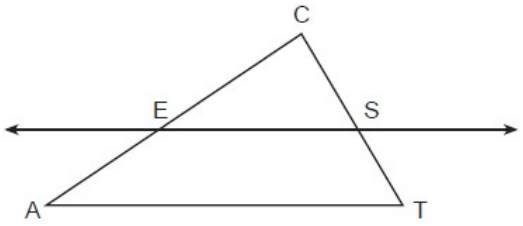
Which statement is always true?

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

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

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

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



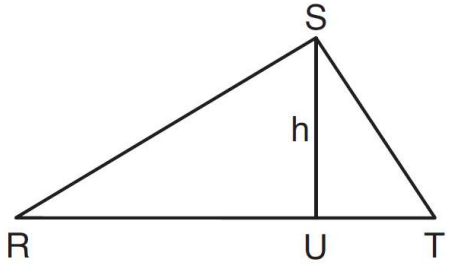

23. In right triangle $RST$ below, altitude $\overline{SU}$ is drawn to hypotenuse $\overline{RT}$. Which of the following proportions is *not* true?

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




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

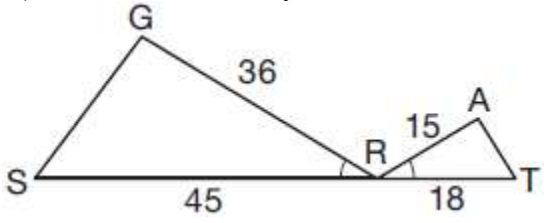
Which triangle similarity statement is correct?

1) $\triangle GRS \sim \triangle ART$ by AA.

2) $\triangle GRS \sim \triangle ART$ by SAS.

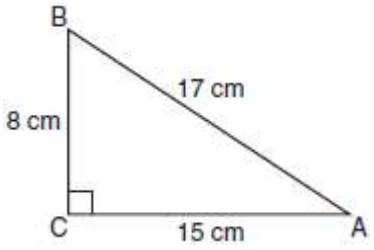
3) $\triangle GRS \sim \triangle ART$ by SSS.

4) $\triangle GRS$ is not similar to $\triangle ART$.



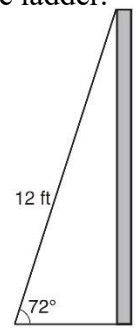
25. Which equation shows a correct trigonometric ratio for angle $A$ in the right triangle below?

1) $\sin A = \frac{15}{17}$
2) $\tan A = \frac{8}{17}$
3) $\cos A = \frac{15}{17}$
4) $\tan A = \frac{5}{8}$




26. As shown in the diagram below, a ladder 12 feet long leans against a wall and makes an angle of 72° with the ground.

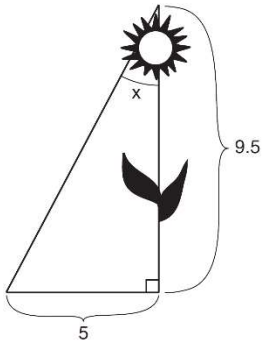
Find, to the *nearest tenth of a foot,* the distance from the wall to the base of the ladder.



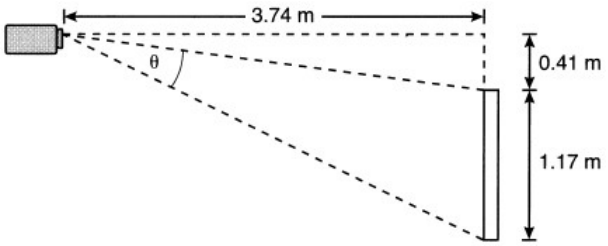

27. The diagram below shows the path a bird flies from the top of a 9.5-foot-tall sunflower to a point on the ground 5 feet from the base of the sunflower.

To the *nearest tenth of a degree*, what is the measure of angle $x$?

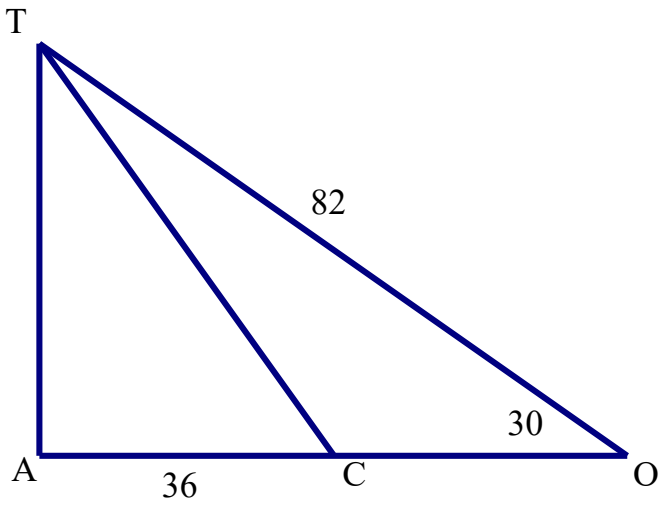
1) 27.8
2) 31.8
3) 58.2
4) 62.2



28. As modeled below, a projector mounted on a ceiling is 3.74 m from a wall, where a whiteboard is displayed. The vertical distance from the ceiling to the top of the whiteboard is 0.41 m, and the height of the whiteboard is 1.17 m. Determine and state the projection angle, $\theta$, to the *nearest tenth of a degree*.




29. Find the measure of $\angle TCA$ in the diagram of right triangle TAO below to the nearest tenth of a degree.




30. Right triangle *TMR* is a scalene triangle with the right angle at *M*. Which equation is true?

1) $\sin M = \cos T$
2) $\sin R = \cos R$
3) $\sin T = \cos R$
4) $\sin T = \cos M$

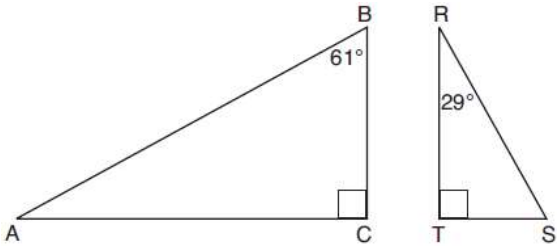
31. In a right triangle, $\sin(40 - x)° = \cos(3x)°$. What is the value of x?

1) 10
2) 15
3) 20
4) 25

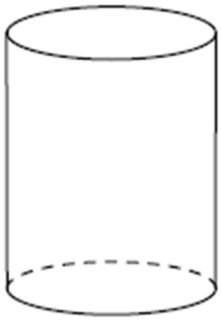
32. Given right triangle $ABC$ with a right angle at $C$, $m\angle B = 61°$. Given right triangle $RST$ with a right angle at $T$, $m\angle R = 29°$.

Which of the following statements is true?

1) $\sin A = \cos C$
2) $\sin B = \cos R$
3) $\sin S = \cos B$
4) $\sin C = \cos T$



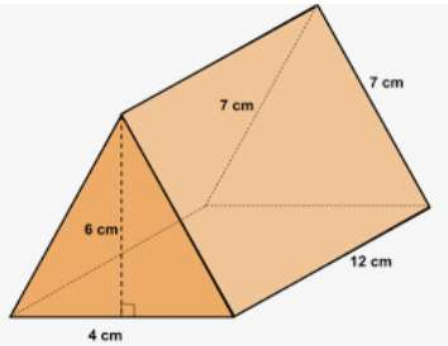

33. A plane intersects a cylinder perpendicular to its bases.



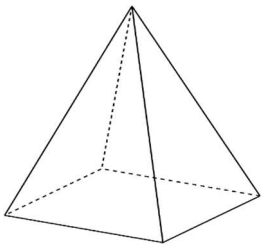
This cross section can be described as a

1) rectangle
2) parabola
3) triangle
4) circle

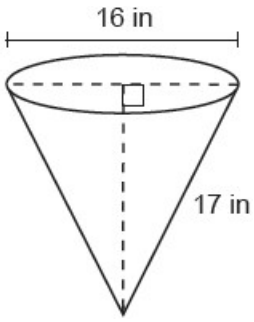
34. Find the volume of the triangular prism below:




35. A regular pyramid has a square base with an edge length of 14 cm and an altitude of 24 cm. Find its volume.



36. In the diagram below, a cone has a diameter of 16 inches and a slant height of 17 inches. What is the volume of the cone, in terms of $\pi$, in cubic inches?




37. Jennifer is having her Sweet 16 party on a giant circular patio that has a radius of 7.2 meters. If there are 83 people at the party, to the nearest tenth, what is the population density?

38. What is the density of a solid sphere of clay that has a diameter of 3.2 inches and has a mass of 552 grams? Round your answer to the nearest tenth.

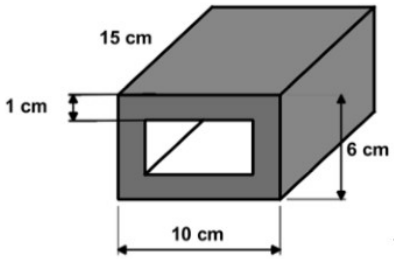
39. A box tube is to be constructed out of 1 cm thick metal that has a width of 10 cm, a height of 6 cm, and a depth of 15 cm. Which of the following represents the volume of the metal used?

(1) 420 $cm^3$

(2) 540 $cm^3$

(3) 640 $cm^3$

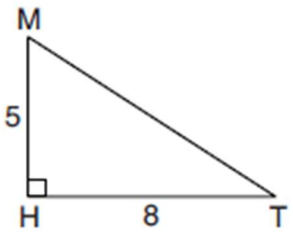
(4) 760 $cm^3$




_____

40. Find the length of the radius of a cylinder to the *nearest tenth* if it has a volume of 60 $cm^3$ and a height of 10 $cm$.

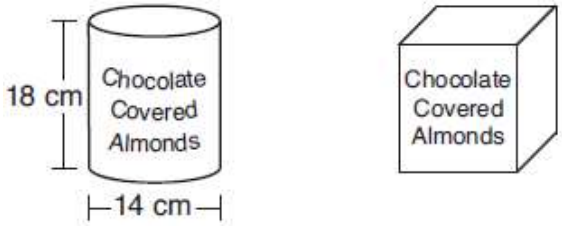
41. In right triangle *MTH* shown below, $m\angle H = 90°$, $HT = 8$, and $HM = 5$. Determine and state, to the *nearest tenth*, the volume of the three-dimensional solid formed by rotating $\triangle MTH$ continuously around $\overline{MH}$.




42. What is the volume, to the *nearest cubic foot*, of a rectangular prism that is 2.4 feet high, 3.2 feet wide, and 9 inches long?

43. A bakery sells hollow chocolate spheres. The larger diameter of each sphere is 4 cm. The thickness of the chocolate of each sphere is 0.5 cm. Determine and state, to the *nearest tenth of a cubic centimeter*, the amount of chocolate in each hollow sphere. The bakery packages 8 of them into a box. If the density of the chocolate is 1.308 g/cm$^3$, determine and state, to the *nearest gram*, the total mass of the chocolate in the box.

44. A manufacturer is designing a new container for their chocolate-covered almonds. Their original container was a cylinder with a height of 18 cm and a diameter of 14 cm. The new container can be modeled by a rectangular prism with a square base and will contain the same amount of chocolate-covered almonds.
If the new container's height is 16 cm, determine and state, to the *nearest tenth of a centimeter*, the side length of the new container if both containers contain the same amount of almonds. A store owner who sells the chocolate-covered almonds displays them on a shelf whose dimensions are 80 cm long and 60 cm wide. The shelf can only hold one layer of new containers when each new container sits on its square base. Determine and state the maximum number of new containers the store owner can fit on the shelf.




45. An equation of circle $M$ is $x^2 + y^2 + 6x - 2y + 1 = 0$. What are the coordinates of the center and the length of the radius of circle $M$?

1) center $(3, -1)$ and radius 9
2) center $(3, -1)$ and radius 3
3) center $(-3, 1)$ and radius 9
4) center $(-3, 1)$ and radius 3

46. Line $y = 3x - 1$ is transformed by a dilation with a scale factor of 2 and centered at $(3, 8)$. The line's image is

1) $y = 3x - 8$
2) $y = 3x - 4$
3) $y = 3x - 2$
4) $y = 3x - 1$

47. Line $y = 3x - 1$ is transformed by a dilation with a scale factor of 2 and centered at the origin. The line's image is

1) $y = 3x - 8$
2) $y = 3x - 4$
3) $y = 3x - 2$
4) $y = 3x - 1$

48. The line $-3x + 4y = 8$ is transformed by a dilation centered at the origin. Which linear equation could represent its image?

1) $y = \frac{4}{3}x + 8$
2) $y = \frac{3}{4}x + 8$
3) $y = -\frac{3}{4}x - 8$
4) $y = -\frac{4}{3}x - 8$

49. 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

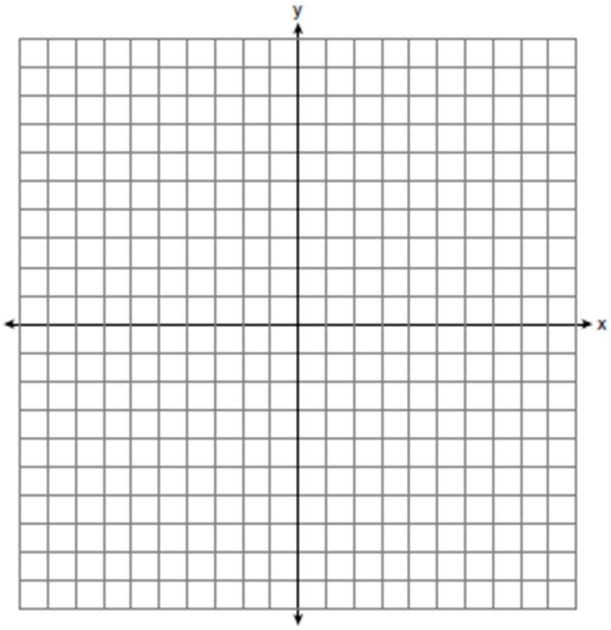
50. The equation of a line is $y = \frac{2}{3}x + 5$. What is an equation of the line that is perpendicular to the given line and that passes through the point $(4,2)$?

1) $y = \frac{2}{3}x - \frac{2}{3}$
2) $y = \frac{3}{2}x - 4$
3) $y = -\frac{3}{2}x + 7$
4) $y = -\frac{3}{2}x + 8$

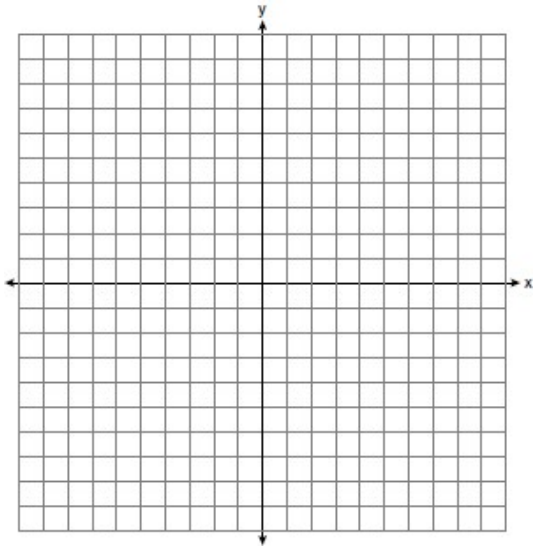
51. What is an equation of a line which passes through $(6, 9)$ and is perpendicular to the line whose equation is $4x - 6y = 15$?

1) $y - 9 = -\frac{3}{2}(x - 6)$
2) $y - 9 = \frac{2}{3}(x - 6)$
3) $y + 9 = -\frac{3}{2}(x + 6)$
4) $y + 9 = \frac{2}{3}(x + 6)$

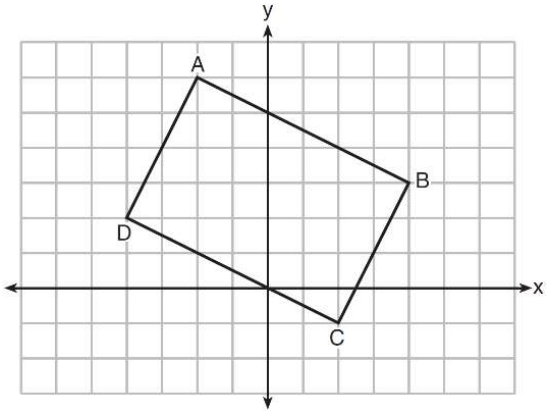
52. Write an equation of the perpendicular bisector of the line segment whose endpoints are (3,5) and (5,9) in both point slope and slope intercept form.



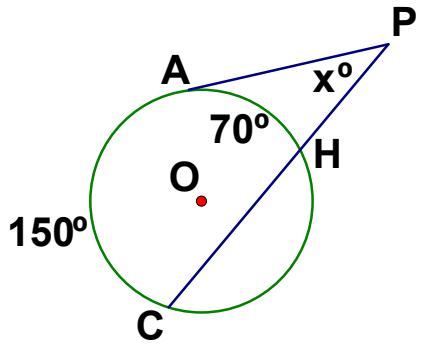

53. Directed line segment $JQ$ has endpoints whose coordinates are $J(8,6)$ and $Q(-10,-3)$. Determine the coordinates of point $O$ that divides the segment in the ratio 5 to 4.



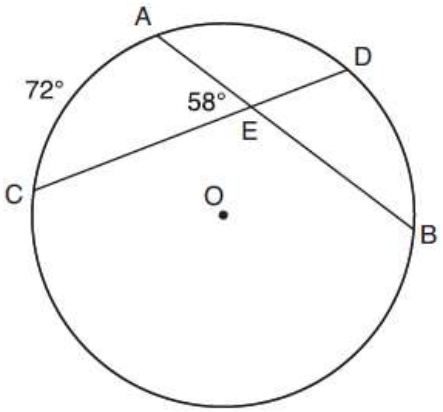

54. Find the area of the quadrilateral graphed below:



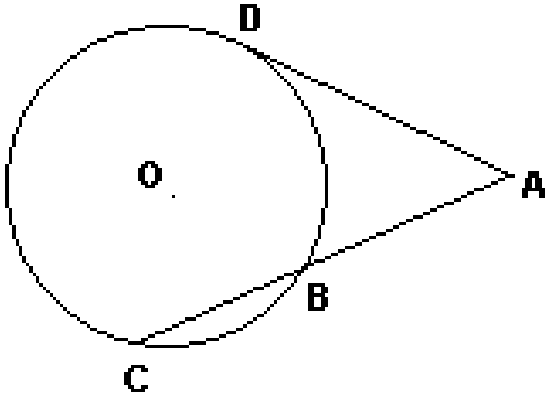
55. In Circle O, $m\overset{\frown}{AC} = 150$ and $m\overset{\frown}{AH} = 70$. Find $m\angle P$



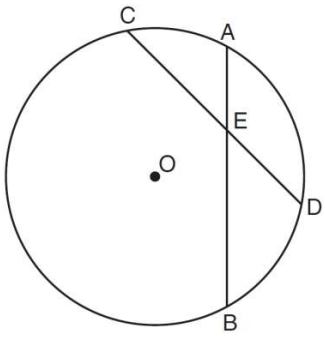

56. In the diagram below of circle *O*, chords $\overline{AB}$ and $\overline{CD}$ intersect at *E*.
If $m\overset{\frown}{AC} = 72°$ and $m\angle AEC = 58°$, how many degrees are in $m\overset{\frown}{DB}$?




57. In the diagram, $\overline{AD}$ is tangent to circle *O* at *D*, and $\overline{CBA}$ is a secant. If $AD = 6$ and $AC = 9$, what is $AB$?

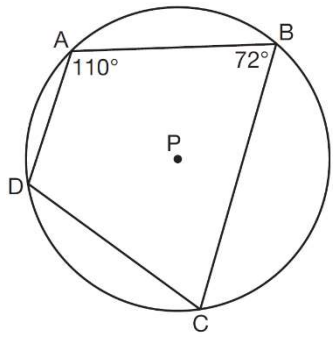


58. In the diagram below of circle $O$, chords $\overline{AB}$ and $\overline{CD}$ intersect at $E$.
If $CE = 10$, $ED = 6$, and $AE = 4$, what is the length of $\overline{EB}$?



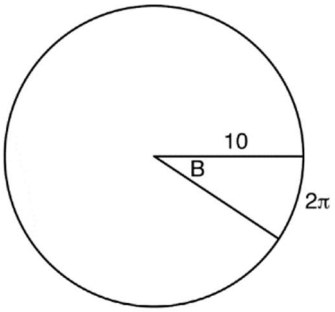

59. In circle $O$ two secants, $\overline{ABP}$ and $\overline{CDP}$, are drawn to external point $P$. If $m\overset{\frown}{AC} = 72°$, and $m\overset{\frown}{BD} = 34°$, what is the measure of $\angle P$?

60. In the diagram below, quadrilateral $ABCD$ is inscribed in circle $P$.
What is $m\angle ADC$?
1) 70°
2) 72°
3) 108°
4) 110°




61. Determine and state, in terms of π, the area of a sector that intercepts a 40° arc of a circle with a radius of 4.5.

62. In the diagram below, the circle shown has radius 10. Angle $B$ intercepts an arc with a length of $2\pi$.
What is the measure of angle $B$, in radians?
1) $10 + 2\pi$
2) $20\pi$
3) $\frac{\pi}{5}$
4) $\frac{5}{\pi}$

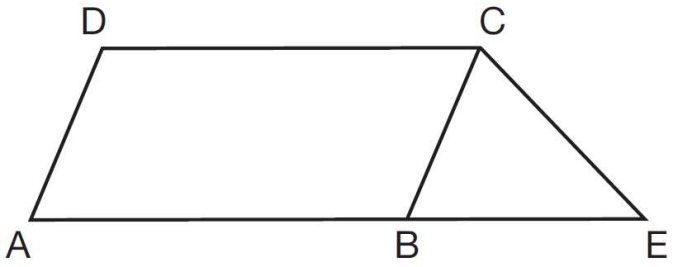


63. A quadrilateral whose diagonals bisect each other and are perpendicular is a

1) rhombus
2) rectangle
3) trapezoid
4) parallelogram

64. A rhombus has diagonals that measure 10 and 24. Find the perimeter of the rhombus.

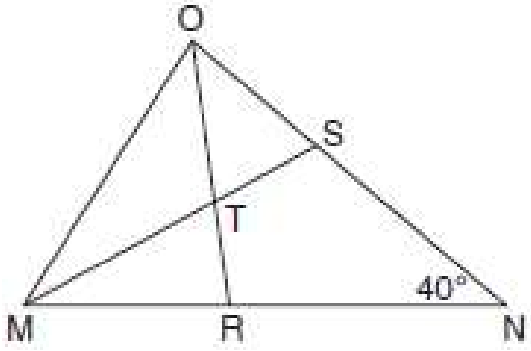
65. In the diagram below, *ABCD* is a parallelogram, $\overline{AB}$ is extended through *B* to *E*, and $\overline{CE}$ is drawn.




If $\overline{CE} \cong \overline{BE}$ and $m\angle D = 112°$, what is $m\angle E$?

1) 44°
2) 56°
3) 68°
4) 112°

66. 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*?




67. In $\Delta XYZ$, $\angle X$ and $\angle Z$ are the base angles. If $m\angle Z = 41°$, find the measure of $\angle Y$.

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

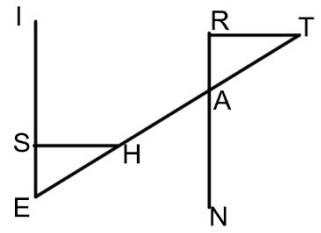
1) $AB > BC$
2) $AC > BC$
3) $AC < BA$
4) $BC < BA$

69. In the two distinct acute triangles *ABC* and *DEF*, $\angle B \cong \angle E$. Triangles *ABC* and *DEF* are congruent when there is a sequence of rigid motions that maps

1) $\angle A$ onto $\angle D$, and $\angle C$ onto $\angle F$
2) $\overline{AC}$ onto $\overline{DF}$, and $\overline{BC}$ onto $\overline{EF}$
3) $\angle C$ onto $\angle F$, and $\overline{BC}$ onto $\overline{EF}$
4) point *A* onto point *D*, and $\overline{AB}$ onto $\overline{DE}$

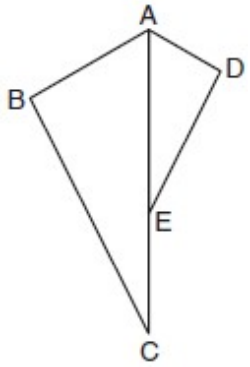
70. Given: $\overline{IE} \parallel \overline{RN}$, $\overline{TR} \perp \overline{RN}$, $\overline{HS} \perp \overline{IE}$, $\overline{EH} \cong \overline{AT}$

Prove: $\overline{SH} \cong \overline{RT}$



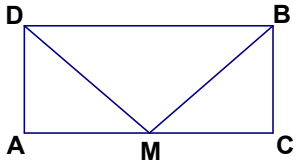

71. Given: $\overline{CA}$ bisects $\angle BAD$, $\angle ABC \cong \angle ADE$

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



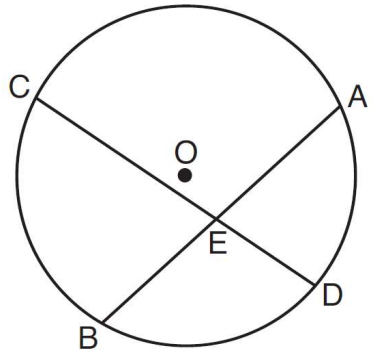
72. Given: ABCD is a rectangle, M is the midpoint of $\overline{AC}$

Prove: $\overline{DM} \cong \overline{BM}$



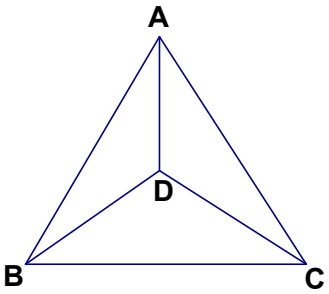

73. Given: Circle $O$, chords $\overline{AB}$ and $\overline{CD}$ intersect at $E$

Theorem: If two chords intersect in a circle, the product of the lengths of the segments of one chord is equal to the product of the lengths of the segments of the other chord. Prove this theorem by proving $AE \cdot EB = CE \cdot ED$.



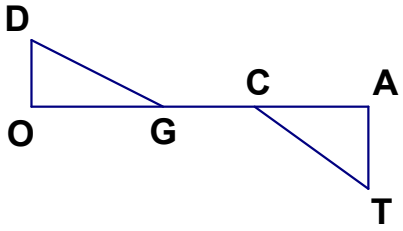

74. Given: $\angle ABC \cong \angle ACB$, $\overline{AD}$ bisects $\angle BAC$

Prove: $\overline{BD} \cong \overline{DC}$



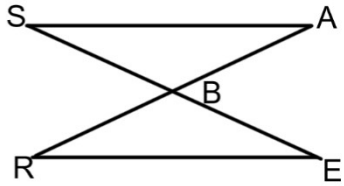
75. Given: $\overline{DO} \perp \overline{OA}$ , $\overline{TA} \perp \overline{OA}$ , $\overline{DO} \cong \overline{TA}, \overline{OC} \cong \overline{AG}$

Prove: $\overline{DG} \cong \overline{TC}$




76. Given: $\overline{SE}$ and $\overline{AR}$ bisect each other.

Prove that $\overline{SA} \| \overline{RE}$




77.

a) Name the two ways to prove a parallelogram is a rectangle.

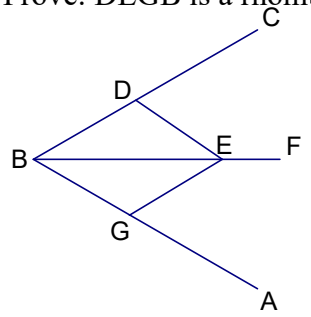
b) Name the three ways to prove a parallelogram is a rhombus.

78. A parallelogram must be a rhombus when its
1) diagonals are perpendicular
2) diagonals are congruent
3) opposite sides are parallel
4) opposite sides are congruent

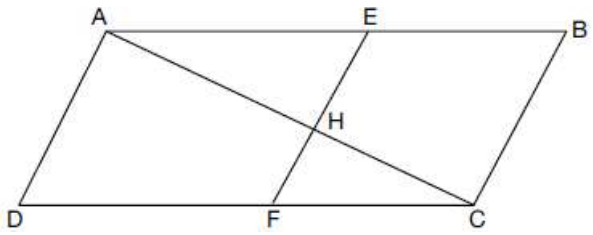
79. In parallelogram *ABCD*, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at *E*. Which statement proves parallelogram *ABCD* is a rectangle?
1) $\overline{AC} \cong \overline{DB}$
2) $\overline{AB} \cong \overline{BC}$
3) $\overline{AC} \perp \overline{DB}$
4) $\overline{AC}$ bisects $\angle DCB$

80. Quadrilateral *BEST* has diagonals that intersect at point *D*. Which statement would *not* be sufficient to prove quadrilateral *BEST* is a parallelogram?
1) $\overline{BD} \cong \overline{SD}$ and $\overline{ED} \cong \overline{TD}$
2) $\overline{BE} \cong \overline{ST}$ and $\overline{ES} \cong \overline{TB}$
3) $\overline{ES} \cong \overline{TB}$ and $\overline{BE} \parallel \overline{TS}$
4) $\overline{ES} \parallel \overline{BT}$ and $\overline{BE} \parallel \overline{TS}$

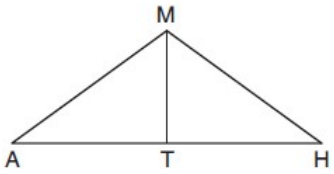
81. Given: BDEG is a parallelogram, $\overline{BF}$ bisects $\angle$ CBA
Prove: DEGB is a rhombus



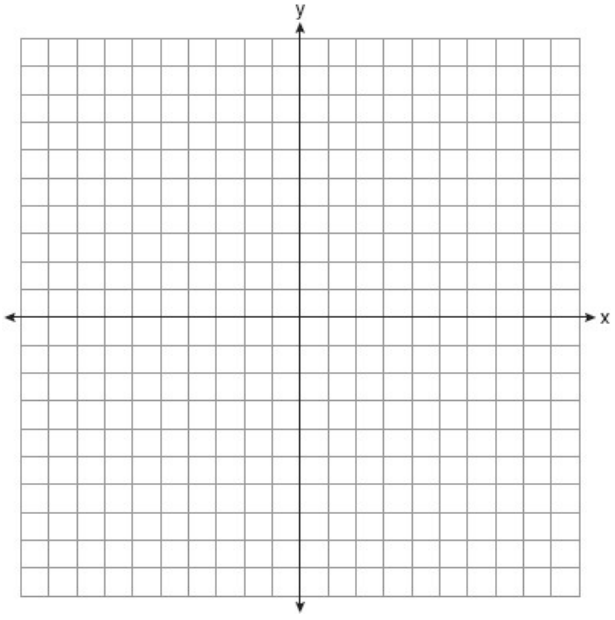
82. Given: Quadrilateral $ABCD$, $\overline{AC}$ and $\overline{EF}$ intersect at $H$, $\overline{EF} \parallel \overline{AD}$, $\overline{EF} \parallel \overline{BC}$, and $\overline{AD} \cong \overline{BC}$.
Prove: $(EH)(CH) = (FH)(AH)$



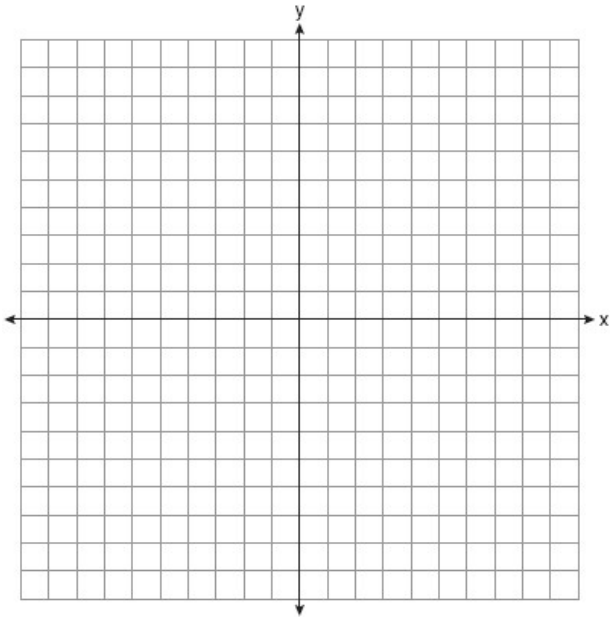

83. In triangle $MAH$ below, $\overline{MT}$ is the perpendicular bisector of $\overline{AH}$.
Which statement is *not* always true?
1) $\triangle MAH$ is isosceles. 2) $\triangle MAT$ is isosceles. 3) $\overline{MT}$ bisects $\angle AMH$. 4) $\angle A$ and $\angle TMH$ are complementary.




84. Quadrilateral $PQRS$ has vertices $P(-2, 3)$, $Q(3, 8)$, $R(4, 1)$, and $S(-1, -4)$. Prove that $PQRS$ is a rhombus. Prove that $PQRS$ is *not* a square. [The use of the set of axes below is optional.]

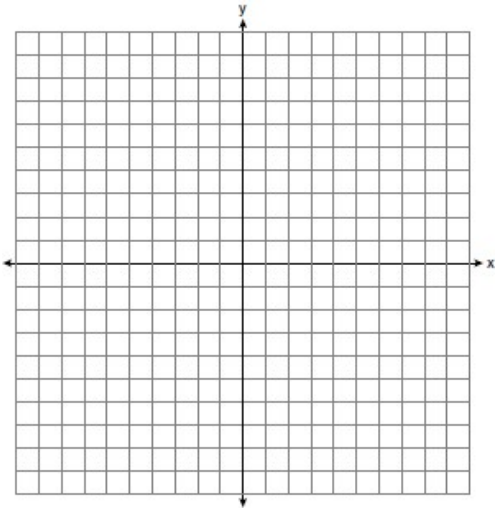


85. The coordinates of the vertices of $\triangle ABC$ are $A(1,2)$, $B(-5,3)$, and $C(-6,-3)$. Prove that $\triangle ABC$ is isosceles. State the coordinates of point $D$ such that quadrilateral $ABCD$ is a square. Prove that your quadrilateral $ABCD$ is a square. [The use of the set of axes below is optional.]




86. Parallelogram $ABCD$ has coordinates $A(0,7)$ and $C(2,1)$. Which statement would prove that $ABCD$ is a rhombus?

1) The midpoint of $\overline{AC}$ is $(1,4)$.
2) The length of $\overline{BD}$ is $\sqrt{40}$.
3) The slope of $\overline{BD}$ is $\frac{1}{3}$.
4) The slope of $\overline{AB}$ is $\frac{1}{3}$.




87. The ratio of the measures of the angles of a triangle is 2:3:5. Find the measure of the *smallest* angle of the triangle.