Name _____ Date _____
Mr. Schlansky Geometry

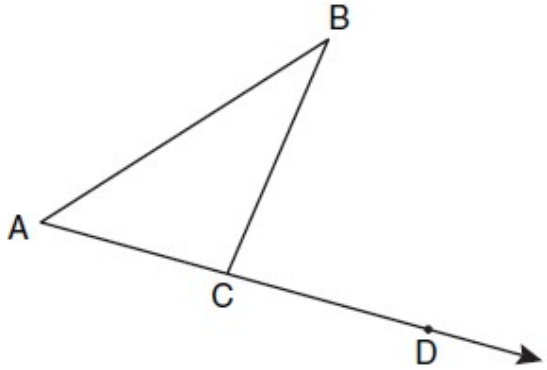
CCG Regents Review Test

1. In triangle *CEM*, $CE = 3x + 10$, $ME = 5x - 14$, and $CM = 2x - 6$. Determine and state the value of *x* that would make *CEM* an isosceles triangle with the vertex angle at *E*.

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

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

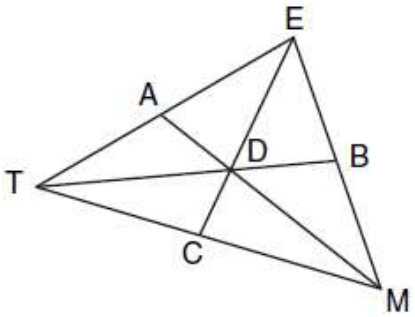
If $m\angle BCD = 6x + 2$, $m\angle BAC = 3x + 15$, and $m\angle ABC = 2x - 1$, what is the value of *x*?



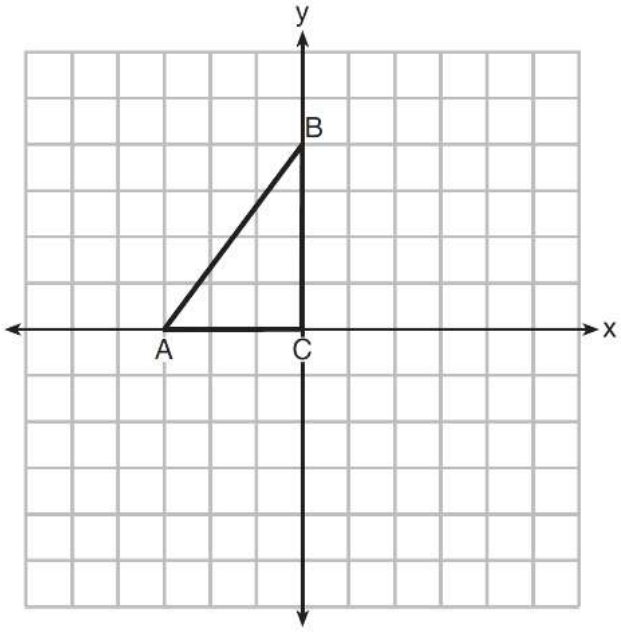
4. Which of the following cannot make up the three sides of a triangle?
1) {3,9,7}
2) {2,7,5}
3) {8,12,15}
4) {9,3,7}

5. 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

6. 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 $\overline{TD}$.



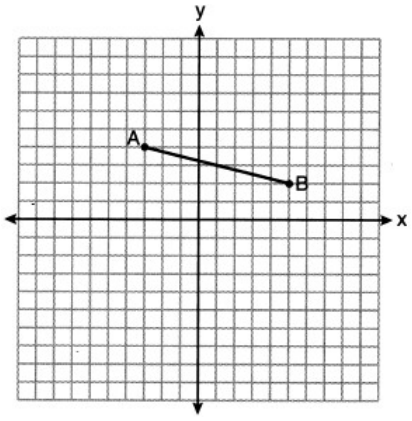
7. Triangle ABC is graphed on the set of axes below. Graph and label $\triangle A'B'C'$, the image of $\triangle ABC$ after a reflection over the line $y = -1$.



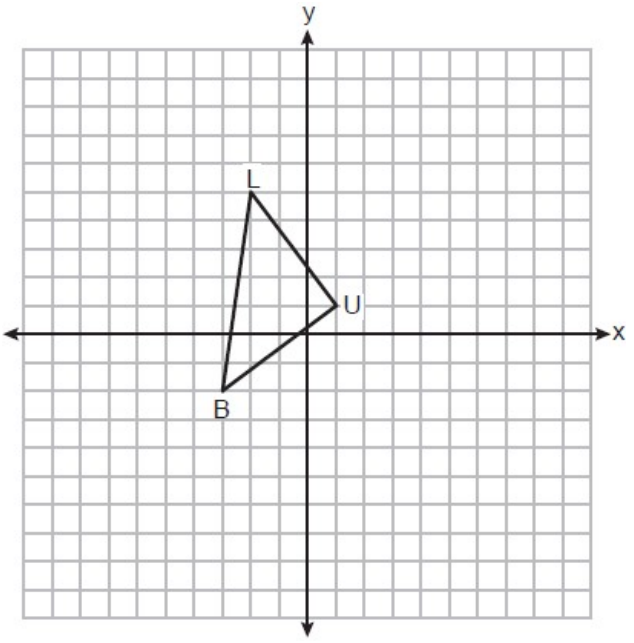
8. On the set of axes below, the endpoints of $\overline{AB}$ have coordinates $A(-3,4)$ and $B(5,2)$.

If $\overline{AB}$ is dilated by a scale factor of 2 centered at $(3,5)$, what are the coordinates of the endpoints of its image, $\overline{A'B'}$?

1) $A'(-7,5)$ and $B'(9,1)$
2) $A'(-1,6)$ and $B'(7,4)$
3) $A'(-6,8)$ and $B'(10,4)$
4) $A'(-9,3)$ and $B'(7,-1)$

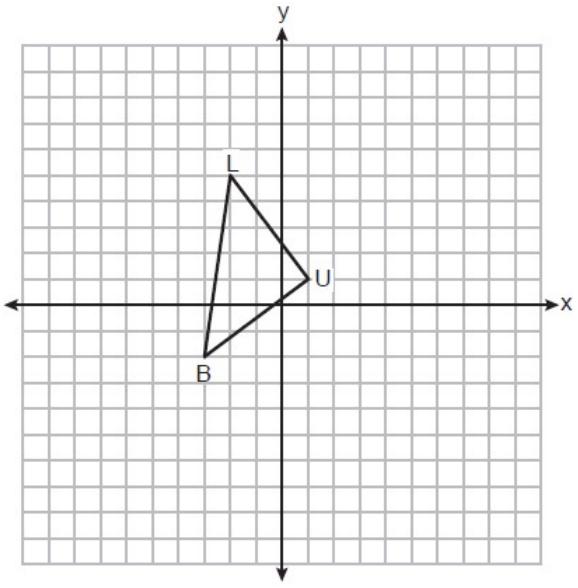


9. On the set of axes below, $\triangle BLU$ has vertices with coordinates $B(-3,-2)$, $L(-2,5)$, and $U(1,1)$. $\Delta B'L'U'$ whose vertices are , $B'(-9,-2)$, $L'(-6,5)$, and $U'(3,1)$ is the image of $\triangle BLU$. What transformation maps $\triangle BLU$ onto $\Delta B'L'U'$?



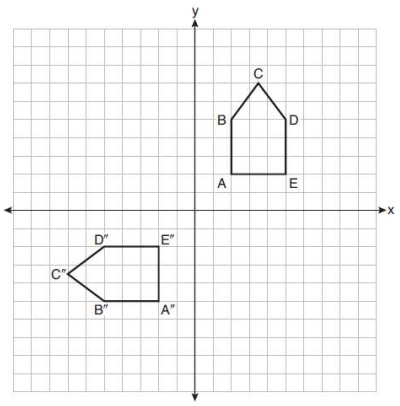
1) dilation
2) translation
3) vertical stretch
4) horizontal stretch

10. The triangle graphed below with vertices at B(-3,-2), U(1,1), and L(-2,5), is graphed on the set of axes below. A horizontal stretch of scale factor 3 with respect to x = 0 is represented by $(x, y) \rightarrow (3x, y)$. Graph the image of this triangle, after the horizontal stretch on the same set of axes.

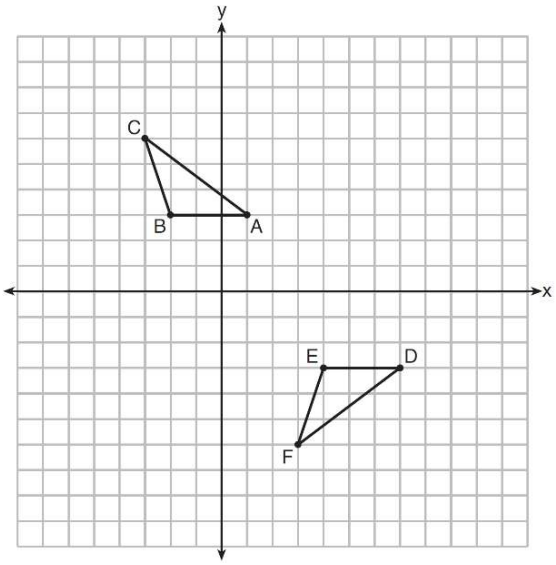


11. On the set of axes below, pentagon *ABCDE* is congruent to *A"B"C"D"E"*. Which describes a sequence of rigid motions that maps *ABCDE* onto *A"B"C"D"E"*?

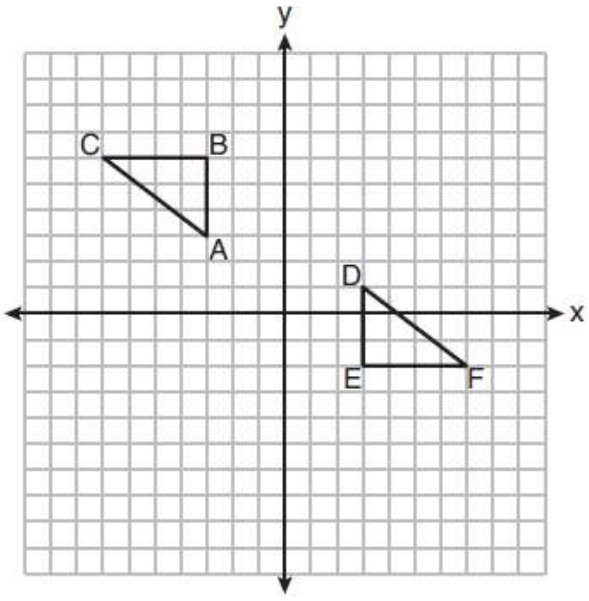
1) a rotation of 90° counterclockwise about the origin followed by a reflection over the *x*-axis
2) a rotation of 90° counterclockwise about the origin followed by a translation down 7 units
3) a reflection over the *y*-axis followed by a reflection over the *x*-axis
4) a reflection over the *x*-axis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



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



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



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

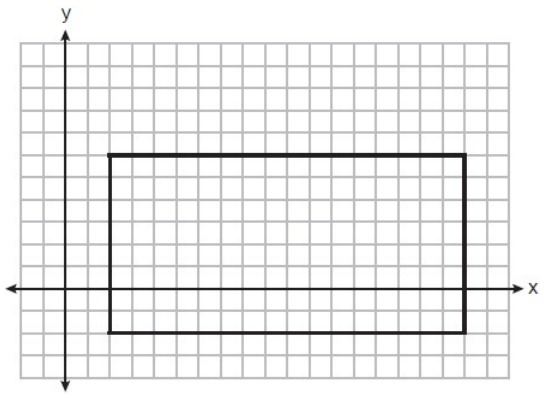
1) reflection over the *y*-axis
2) rotation of 90° clockwise about the origin
3) translation of 3 units right and 2 units down
4) A vertical stretch with a scale factor of 2 centered at the x-axis

15. The image of triangle ABC after a rotation of 200 degrees clockwise centered at the point (3,-1) is triangle DEF. Are the triangles congruent? Use the properties of rigid motions to explain your answer.

16. Which rotation about its center will carry a regular decagon onto itself?

1) 54°
2) 162°
3) 198°
4) 252°

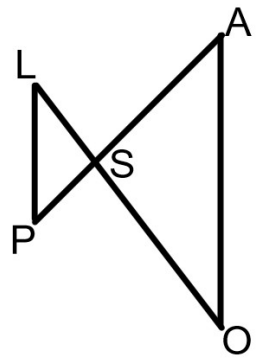
17. A rectangle is graphed on the set of axes below.



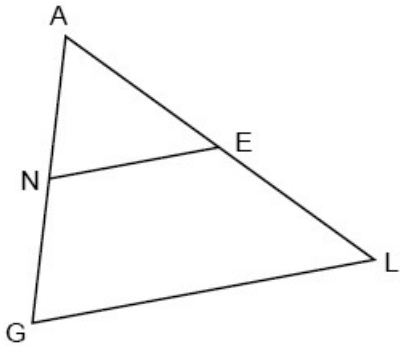
A reflection over which line would carry the rectangle onto itself?

1) $y = 2$
2) $y = 10$
3) $y = \frac{1}{2}x - 3$
4) $y = -\frac{1}{2}x + 7$

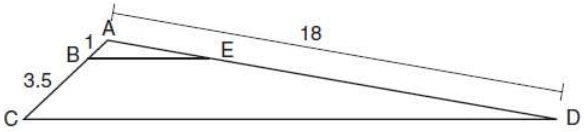
18. In the diagram below, $\overline{LP} \parallel \overline{AO}$. If $LS = 8$, $SO = 12$, $AO = 11$, and $PS = 6$, find SA.



19. In $\triangle AGL$ below, N and E are the midpoints of $\overline{AG}$ and $\overline{AL}$, respectively, $\overline{NE}$ is drawn. If $NE = 15$ and $GL = 3x - 12$, determine and state the value of x.

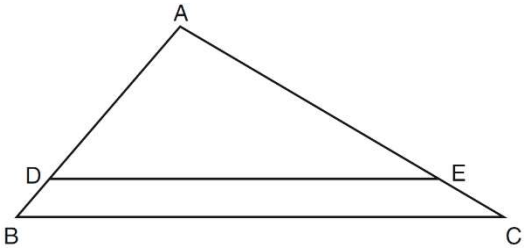


20. In the diagram below, triangle ACD has points B and E on sides $\overline{AC}$ and $\overline{AD}$, respectively, such that $\overline{BE} \parallel \overline{CD}$, $AB = 1$, $BC = 3.5$, and $AD = 18$.



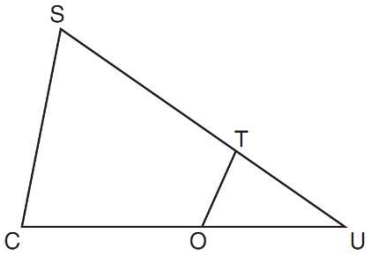
What is the length of $\overline{AE}$, to the *nearest tenth*?

21. 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 $\overline{BC}$

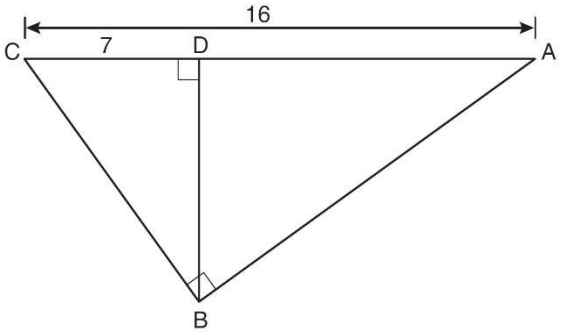


22. In $\triangle SCU$ shown below, points *T* and *O* are on $\overline{SU}$ and $\overline{CU}$, respectively. Segment *OT* is drawn so that $\angle C \cong \angle OTU$.

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



23. 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 $\overline{BD}$ to the *nearest tenth*?

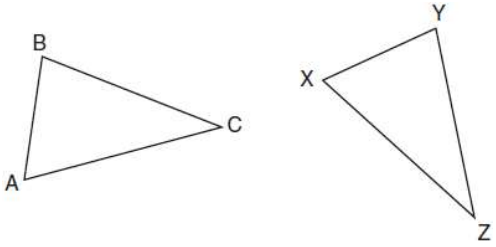


24. Line segment *CD* is the altitude drawn to hypotenuse $\overline{EF}$ in right triangle *ECF*. If $EC = 10$ and $EF = 24$, then, to the *nearest tenth*, *ED* is (hint: draw HLLS SAAS picture)

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

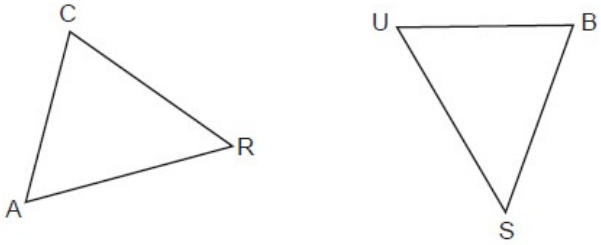
25. In the diagram below of $\triangle ABC$ and $\triangle XYZ$, a sequence of rigid motions maps $\angle A$ onto $\angle X$, $\angle C$ onto $\angle Z$, and $\overline{AC}$ onto $\overline{XZ}$.. Which of the following statements is *not* true?

1) $\overline{AB} \cong \overline{XY}$
2) $\overline{BC} \cong \overline{XZ}$
3) $\angle B \cong \angle Y$
4) $\angle C \cong \angle Z$



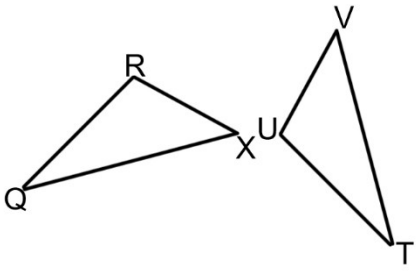
26. In the diagram below, $\triangle CAR$ is mapped onto $\triangle BUS$ after a sequence of rigid motions.
If $AR = 3x + 4$, $RC = 5x - 10$, $CA = 2x + 6$, and $SB = 4x - 4$, what is the length of $\overline{SB}$?

1) 6
2) 16
3) 20
4) 28



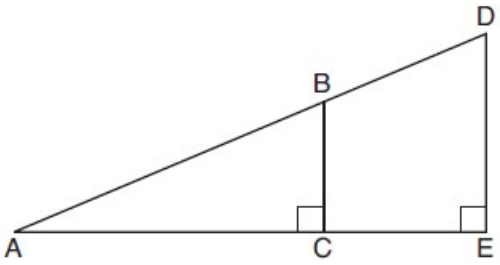
27. In the diagram below, $\Delta QRX \sim \Delta TUV$. Which of the following statements is *not* true?

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



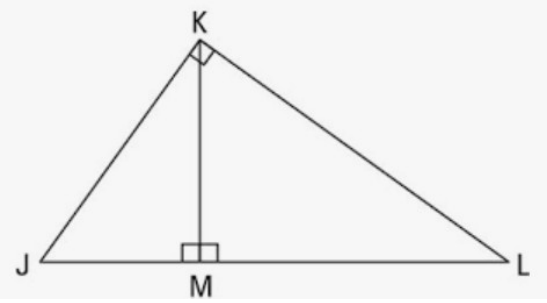
28. In the diagram below of right triangle *AED*, $\overline{BC} \parallel \overline{DE}$.
Which statement is always true?

1) $\frac{AC}{BC} = \frac{DE}{AE}$
2) $\frac{AB}{AD} = \frac{BC}{DE}$
3) $\frac{AC}{CE} = \frac{BC}{DE}$
4) $\frac{DE}{BC} = \frac{DB}{AB}$

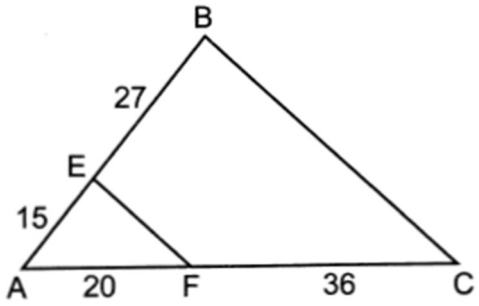


29. In right triangle *JKL* below, altitude $\overline{KM}$ is drawn to hypotenuse $\overline{JL}$. Which of the following proportions is *not* true?

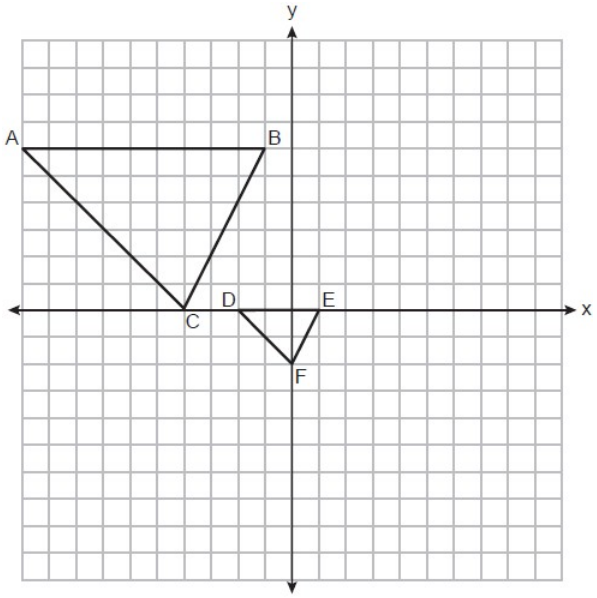
1) $\frac{\overline{JL}}{\overline{JK}} = \frac{\overline{JK}}{\overline{JM}}$
2) $\frac{\overline{JM}}{\overline{KM}} = \frac{\overline{KM}}{\overline{ML}}$
3) $\frac{\overline{JL}}{\overline{KL}} = \frac{\overline{KL}}{\overline{JM}}$
4) $\frac{\overline{ML}}{\overline{MK}} = \frac{\overline{MK}}{\overline{MJ}}$



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

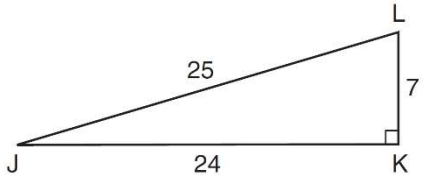


31. Find the center of dilation AND the scale factor if $\triangle ABC$ is the image of $\triangle DEF$



32. 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?

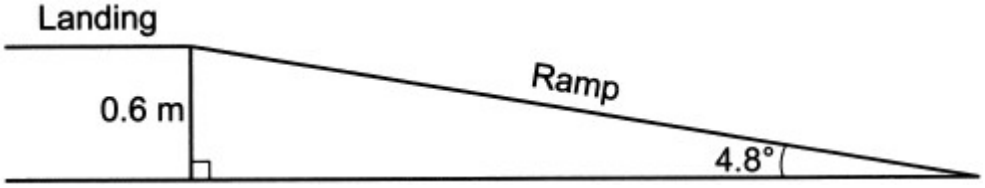
33. In right triangle *JKL* in the diagram below, $KL = 7$, $JK = 24$, $JL = 25$, and $\angle K = 90°$.



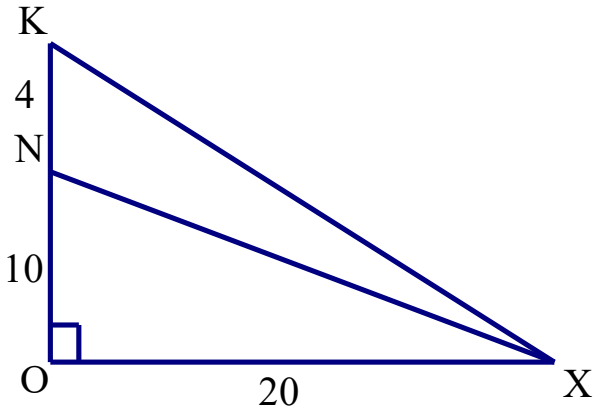
Which statement is *not* true?

1) $\tan L = \frac{24}{7}$
2) $\cos L = \frac{24}{25}$
3) $\tan J = \frac{7}{24}$
4) $\sin J = \frac{7}{25}$

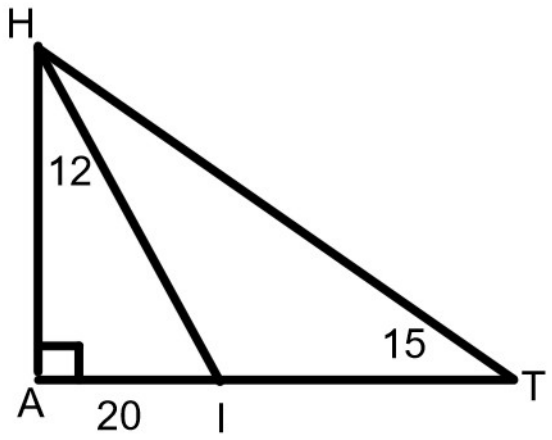
34. The ramp shown in the diagram below has an angle of elevation of 4.8º. The ramp is built to a landing 0.6 m above the ground. Determine and state the length of the ramp, to the *nearest tenth of a meter*.



35. Find the measure of $\angle KXN$ below the *nearest degree*.



36. Find the measure of $\overline{HT}$ in the diagram of right triangle HAT below to the nearest unit.



37. Right triangle ACT has $m\angle A = 90°$. Which expression is always equivalent to $\cos T$?

1) $\cos C$
2) $\sin C$
3) $\tan T$
4) $\sin T$

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

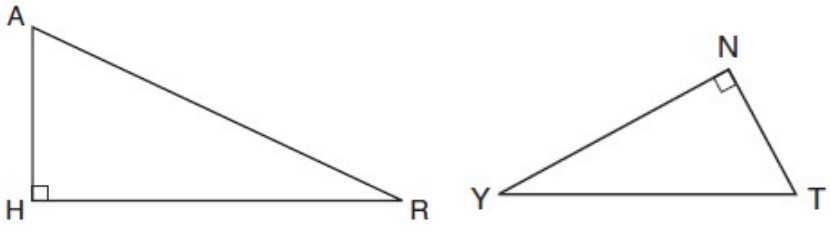
1) 10
2) 15
3) 20
4) 25

39. Which of the following is equivalent to $\cos 57$?

1) $\sin 57$
2) $\sin 33$
3) $\cos 33$
4) $\cos 123$

40. In the diagram below of $\triangle HAR$ and $\triangle NTY$, angles H and N are right angles, and $\triangle HAR \sim \triangle NTY$. If $AR = 13$ and $HR = 12$, what is the measure of angle Y, to the *nearest degree*?

1) 23°
2) 25°
3) 65°
4) 67°



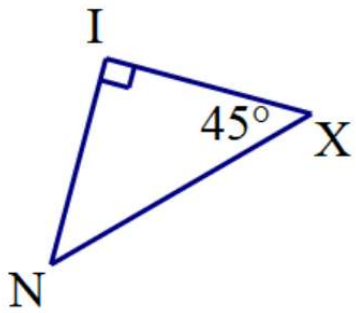
41. In right triangle *NIX* below, $m\angle I = 90°$, $m\angle X = 45°$, and $\overline{NX} = 6\sqrt{2}$. Find $\overline{IX}$.

1) $6\sqrt{2}$

2) 6

3) $12\sqrt{2}$

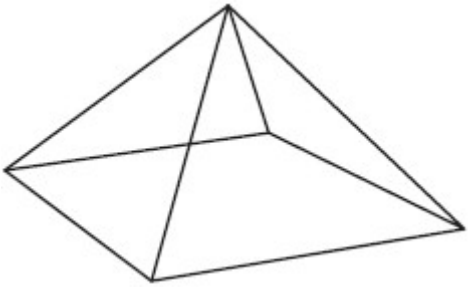
4) 12



42. A square pyramid is intersected by a plane passing through the vertex and perpendicular to the base.

Which two-dimensional shape describes this cross section?

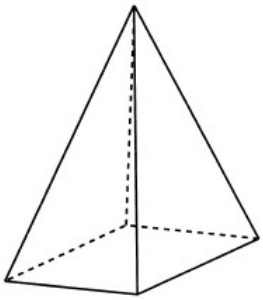
1) square
2) triangle
3) pentagon
4) rectangle



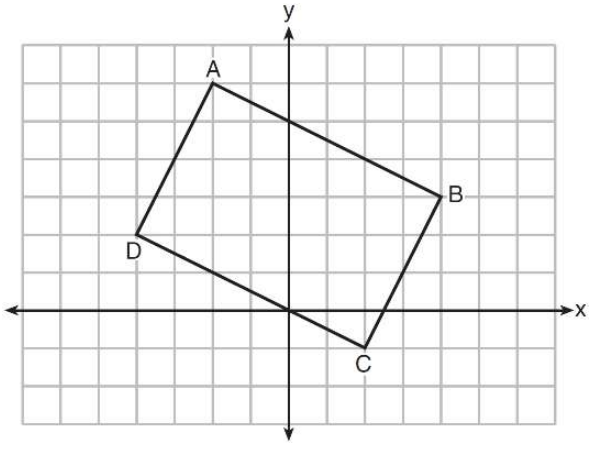
43. In the diagram below, a plane intersects a square pyramid parallel to its base.

Which two-dimensional shape describes this cross section?

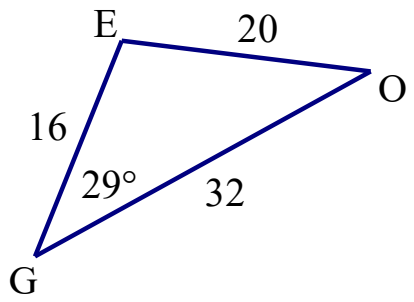
1) circle
2) square
3) triangle
4) pentagon



44. Find the area of *ABCD*

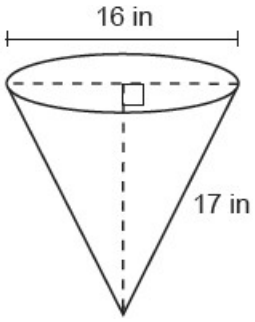


45. Find the area of *GEO* to the *nearest tenth*.



46. Find the volume of a square pyramid with a base with edge length 4 inches and a height of 18 inches.

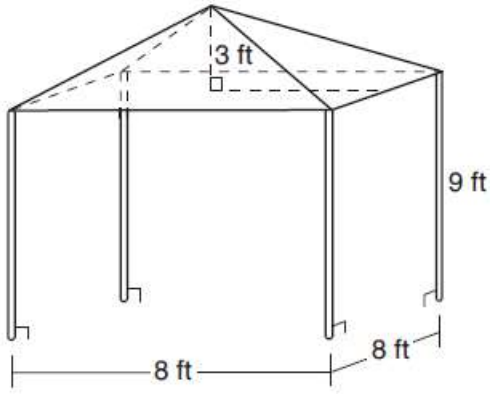
47. In the diagram below, a cone has a diameter of 16 inches and a slant height of 17 inches. What is the volume of the cone, in terms of π, in cubic inches?



48. Town A has an area of 12 square miles. Town B has an area of 10 square miles. If town A has a population of 8,198 people and town B has a population of 7,384 people, which town has a greater population density? Justify your answer.

49. A cylindrical candleholder has a diameter of 4.5 cm and a height of 20 cm. If the candleholder has a mass of 2900 g, rounded to the nearest whole number, what is its density?

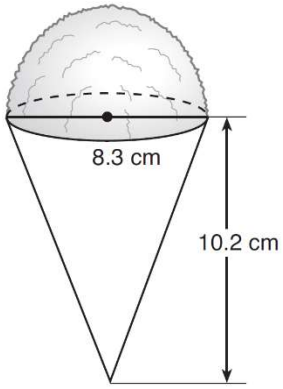
50. Find the volume of the shape below:



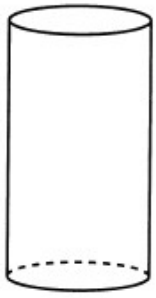
51. A hollow sphere has an outer diameter of 10 feet, and a thickness of 1.5 feet. Find the volume of the hollow sphere to the nearest tenth of a cubic foot.

52. A child's tent can be modeled as a pyramid with a square base whose sides measure 60 inches and whose height measures 84 inches. What is the volume of the tent, to the *nearest cubic foot*?

53. A snow cone consists of a paper cone completely filled with shaved ice and topped with a hemisphere of shaved ice, as shown in the diagram below. The inside diameter of both the cone and the hemisphere is 8.3 centimeters. The height of the cone is 10.2 centimeters. The desired density of the shaved ice is $0.697\ g/cm^3$, and the cost of the ice is $3.83 per 1000 grams. Determine and state the cost of the ice needed to make 50 snow cones.

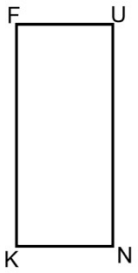


54. A concrete footing is a cylinder that is placed in the ground to support a building structure. The cylinder is 4 feet tall and 12 inches in diameter. A contractor is installing 10 footings. If a bag of concrete mix makes $\frac{2}{3}$ of a cubic foot of concrete, determine and state the minimum number of bags of concrete mix needed to make all 10 footings.



*55. Ice cream cones are to be packed into a shipping box that has a base that measures 20 inches by 12 inches and has a height of 10 inches. The cones have a diameter of 1.2 inches and a height of 3.2 inches. How many cones can be packed into the box?

56. In the rectangle below, $\overline{UN} = 8in$ and $\overline{KN} = 3in$. Find the volume of the three dimensional object created by rotating rectangle FUNK continuously about side $\overline{FK}$ in terms of π.



57. The line $y = -\frac{1}{2}x + 6$ is dilated by a scale factor of 4 and centered at (2,5). Write an equation that represents the image of the line after the dilation.

1) $y = -\frac{1}{2}x + 6$
2) $y = -\frac{1}{2}x + 24$
3) $y = -2x + 6$
4) $y = -2x + 24$

58. The line $y = -\frac{1}{2}x + 6$ is dilated by a scale factor of 4 and centered at the origin. Write an equation that represents the image of the line after the dilation.

1) $y = -\frac{1}{2}x + 6$
3) $y = -2x + 6$
2) $y = -\frac{1}{2}x + 24$
4) $y = -2x + 24$

59. The line $3y = -2x + 8$ is transformed by a dilation centered at the origin. Which linear equation could be its image?

1) $2x + 3y = 5$
2) $2x - 3y = 5$
3) $3x + 2y = 5$
4) $3x - 2y = 5$

60. What is an equation of the line that contains the point $(3,-1)$ and is perpendicular to the line whose equation is $y=-3x+2$?

1) $y=-3x+8$

2) $y=-3x$

3) $y=\frac{1}{3}x$

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

61. An equation of the line that passes through $(2,-1)$ and is parallel to the line $2y+3x=8$ is

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

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

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

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

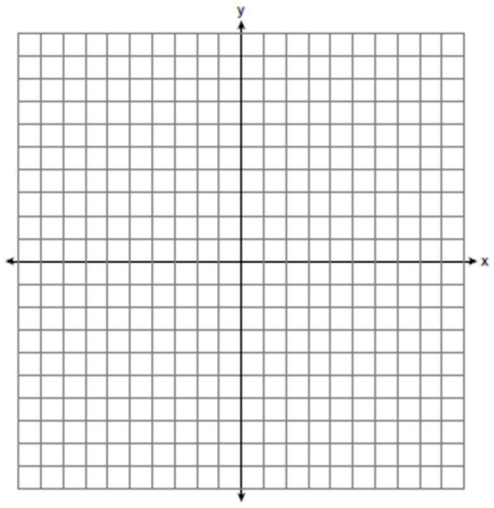
62. Segment JM has endpoints $J(-5,1)$ and $M(7,-9)$. An equation of the perpendicular bisector of $\overline{JM}$ is

1) $y-4=\frac{5}{6}(x+1)$

2) $y+4=\frac{5}{6}(x-1)$

3) $y-4=\frac{6}{5}(x+1)$

4) $y+4=\frac{6}{5}(x-1)$



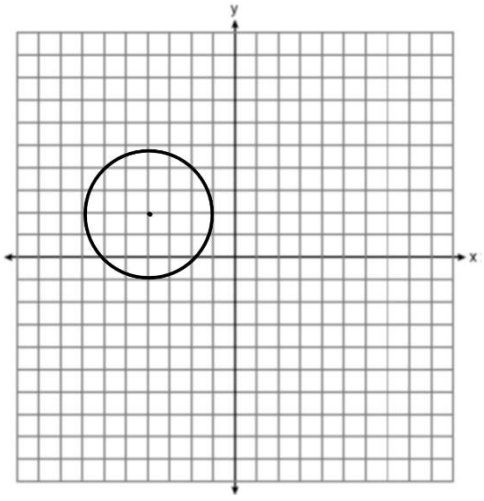
63. Which of the following is the equation of the given circle?

1) $(x-4)^2+(y+2)^2=9$

2) $(x-4)^2+(y+2)^2=3$

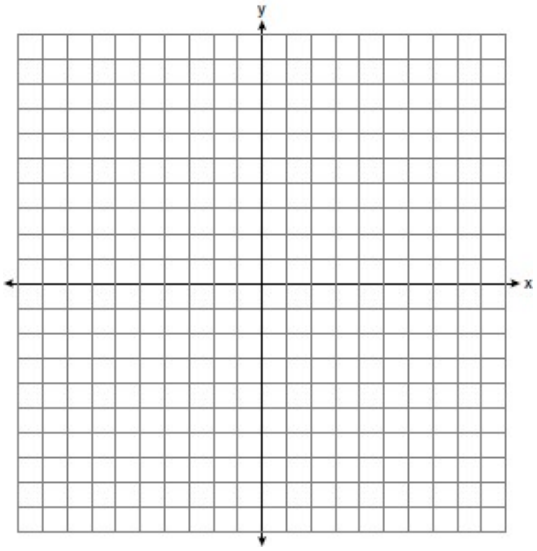
3) $(x+4)^2+(y-2)^2=9$

4) $(x+4)^2+(y-2)^2=3$

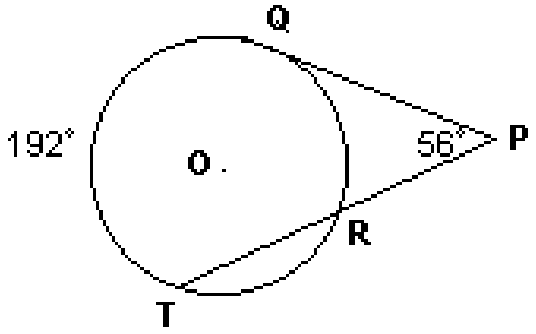


64. Find the coordinates of the center and radius of a circle whose equation is $x^2 + y^2 + 10x - 12y = 3$

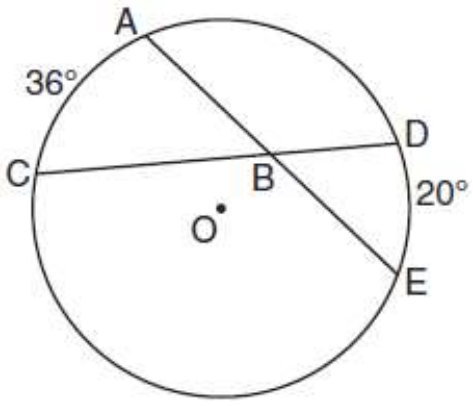
65. What are the coordinates of the point on the directed line segment from $P(-1,6)$ to $S(5,3)$ that partitions the segment into a ratio of 1 to 2?



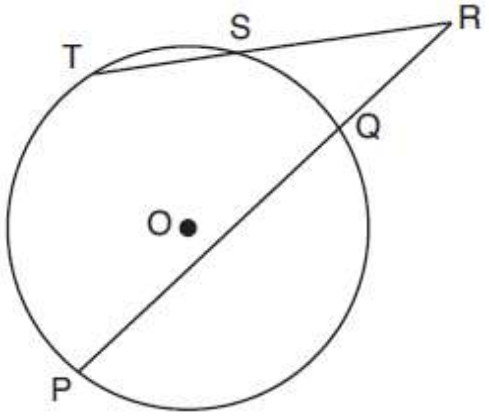
66. In the diagram of circle O, $\overline{PQ}$ is tangent to O at Q and $\overline{PRT}$ is a secant. If $m\angle P = 56°$ and $m\overset{\frown}{QT} = 192°$, find $m\overset{\frown}{QR}$.



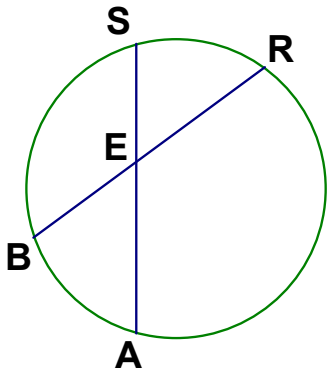
67. In the diagram below of circle O, chords $\overline{AE}$ and $\overline{DC}$ intersect at point B, such that $\text{m}\overset{\frown}{AC} = 36$ and $\text{m}\overset{\frown}{DE} = 20$. What is $\text{m}\angle ABC$?



68. In the diagram below, secants $\overline{RST}$ and $\overline{RQP}$, drawn from point R, intersect circle O at S, T, Q, and P.
If $RS = 6$, $ST = 4$, and $RP = 15$, what is the length of $\overline{RQ}$?

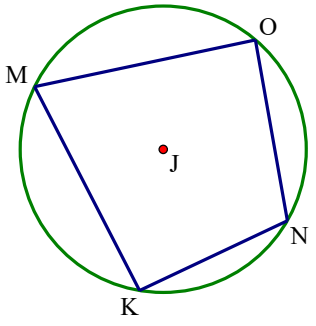


69. If $\overline{BR}$ =10, $\overline{BE}$ = 4, $\overline{AE}$ = 8, find $\overline{ES}$

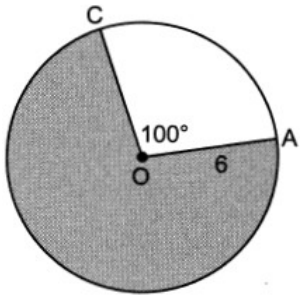


70. Diameter $\overline{ROQ}$ of circle O is extended through Q to point P, and tangent $\overline{PA}$ is drawn. If $m\overset{\frown}{RA} = 100°$, what is $m\angle P$?

71. In the diagram below, quadrilateral MONK is inscribed in circle J, $m\angle KMO = 48°$ and $m\angle MON = 80°$. Find the measures of $m\angle KNO$ and $m\angle MKN$.

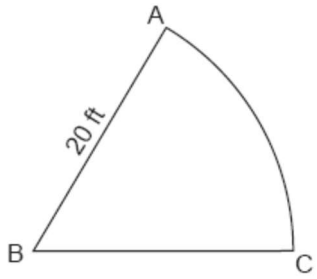


72. In circle O below, $OA = 6$, and $m\angle COA = 100°$. What is the area of the shaded sector?



1) 10π
2) 26π
3) $\frac{10\pi}{3}$
4) $\frac{26\pi}{3}$

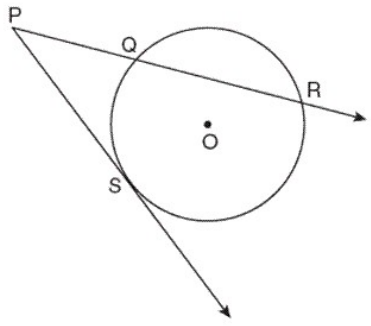
73. A sprinkler system is set up to water the sector shown in the accompanying diagram, with angle ABC measuring 57 degrees and radius AB=20 feet. What is the length of arc AC, to the nearest tenth of a foot?



74. The area of a sector of a circle with a radius measuring 15 cm is 75π cm^2. What is the measure of the central angle that forms the sector?

1) 72°
2) 120°
3) 144°
4) 180°

*75. In the diagram below, $\overline{PS}$ is a tangent to circle O at point S, $\overline{PR}$ is a secant, $PS = x$, $PQ = 3$, and $PR = x + 18$. What is the length of $\overline{PS}$?

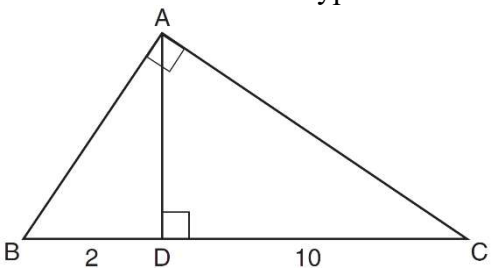


(Not drawn to scale)

76. 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) $2\sqrt{30}$



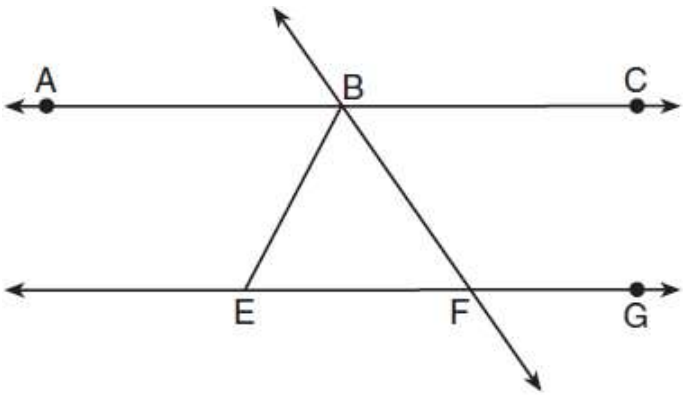
77. A parallelogram must be a rhombus when its
1) Diagonals are congruent.
2) Opposite sides are parallel.
3) Diagonals are perpendicular.
4) Opposite angles are congruent.

78. If $ABCD$ is a parallelogram, which statement would prove that $ABCD$ is a rectangle?
1) $\angle ABC \cong \angle CDA$
2) $\overline{AC} \cong \overline{BD}$
3) $\overline{AC} \perp \overline{BD}$
4) $\overline{AB} \perp \overline{CD}$

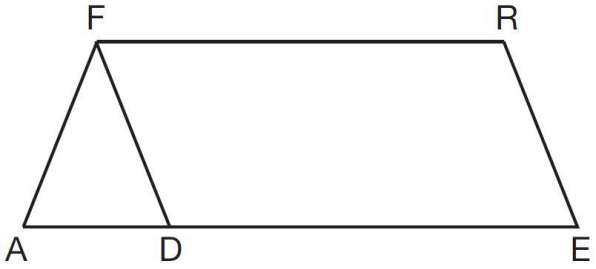
79. A rhombus has diagonals that measure 10 and 24. Find the perimeter of the rhombus.

80. As shown in the diagram below, $\overleftrightarrow{ABC} \parallel \overleftrightarrow{EFG}$ and $\overline{BF} \cong \overline{EF}$.

If $m\angle CBF = 42.5°$, then $m\angle EBF$ is
1) 42.5°
2) 68.75°
3) 95°
4) 137.5°



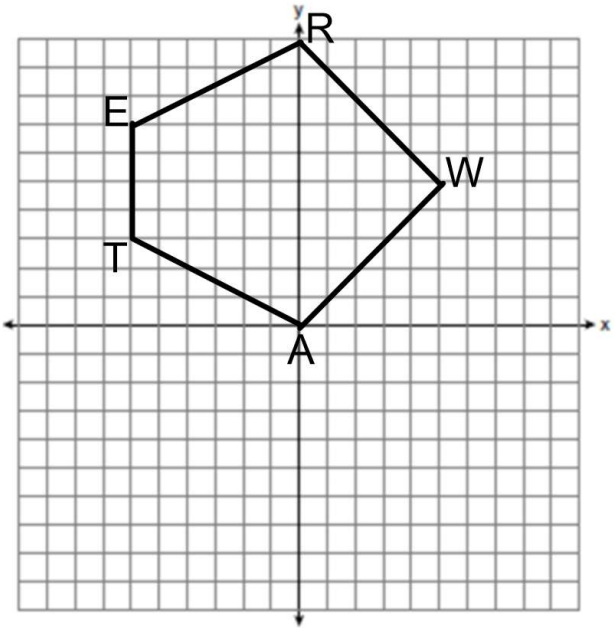
81. In the diagram of parallelogram *FRED* shown below, $\overline{ED}$ is extended to *A*, and $\overline{AF}$ is drawn such that $\overline{AF} \cong \overline{DF}$.



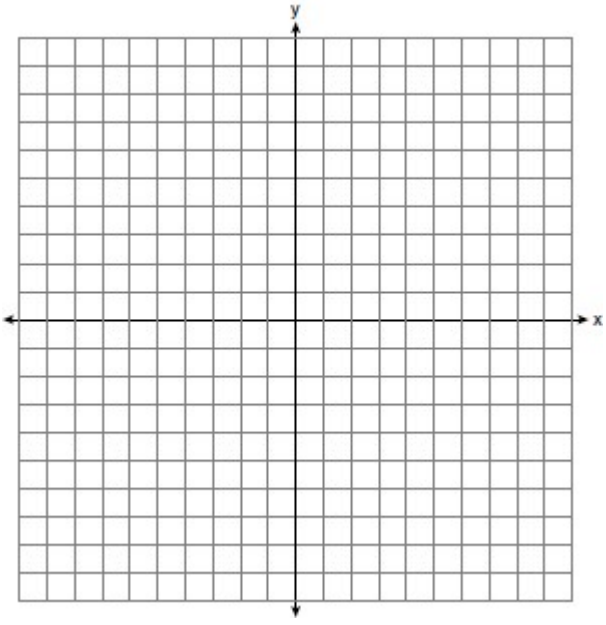
If $m\angle R = 124°$, what is $m\angle AFD$?

1) 124°
2) 112°
3) 68°
4) 56°

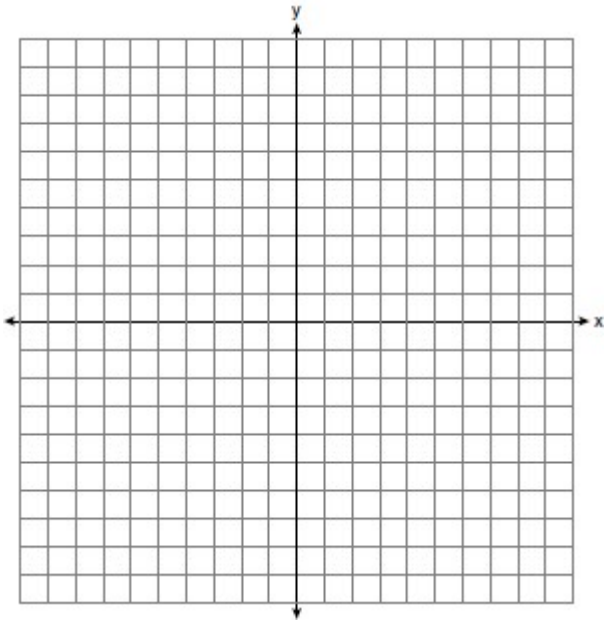
82. Find the perimeter of *WATER* in simplest radical form.



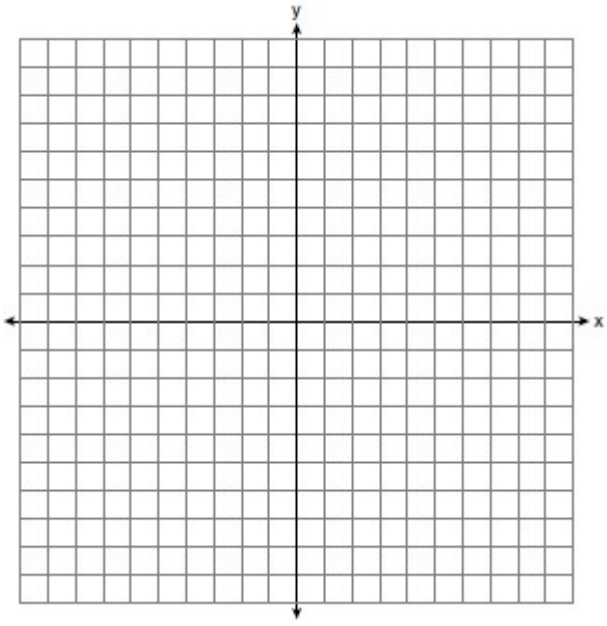
83. A triangle has vertices $A(-2,4)$, $B(6,2)$, and $C(1,-1)$. Prove that $\triangle ABC$ is an isosceles right triangle. [The use of the set of axes below is optional.]



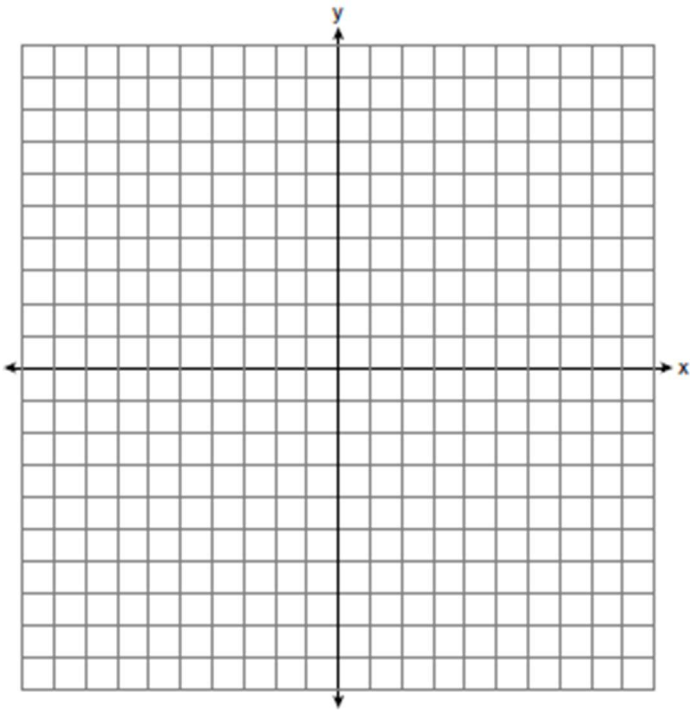
84. The vertices of quadrilateral *MATH* have coordinates $M(-4, 2)$, $A(-1, -3)$, $T(9, 3)$, and $H(6, 8)$. Prove that quadrilateral *MATH* is a rectangle but not a square. [The use of the set of axes below is optional.]



85. Quadrilateral ABCD has vertices A(3,1) B(-3,5) C(5,4) and D(2,6). Prove quadrilateral ABCD is a trapezoid but *not* an isosceles trapezoid.



86. Triangle *PET* has vertices with coordinates $P(-6,4)$, $E(6,8)$, and $T(-4,-2)$. Prove $\triangle PET$ is a right triangle. State the coordinates of *N*, the image of *P*, after a 180° rotation centered at $(1,3)$. Prove *PENT* is a rectangle. [The use of the set of axes below is optional.]



Reference Sheet for Geometry (NGLS)

Volume	Cylinder	$V = Bh$ where B is the area of the base
	General Prism	$V = Bh$ where B is the area of the base
	Sphere	$V = \frac{4}{3}\pi r^3$
	Cone	$V = \frac{1}{3}Bh$ where B is the area of the base
	Pyramid	$V = \frac{1}{3}Bh$ where B is the area of the base