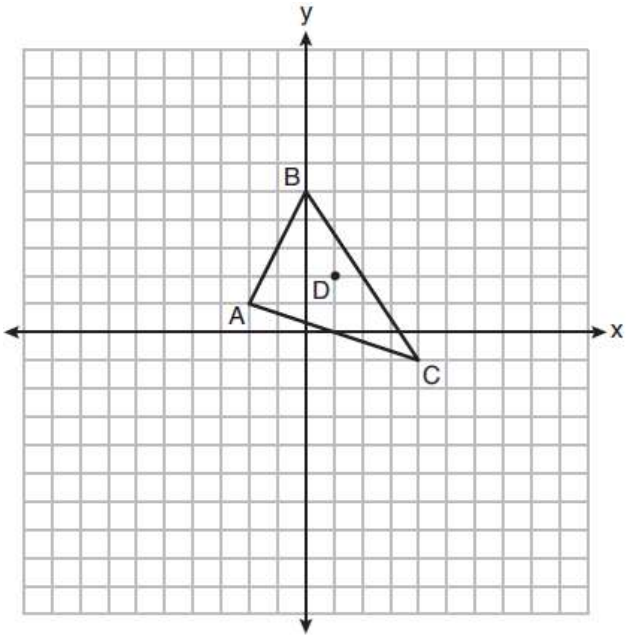
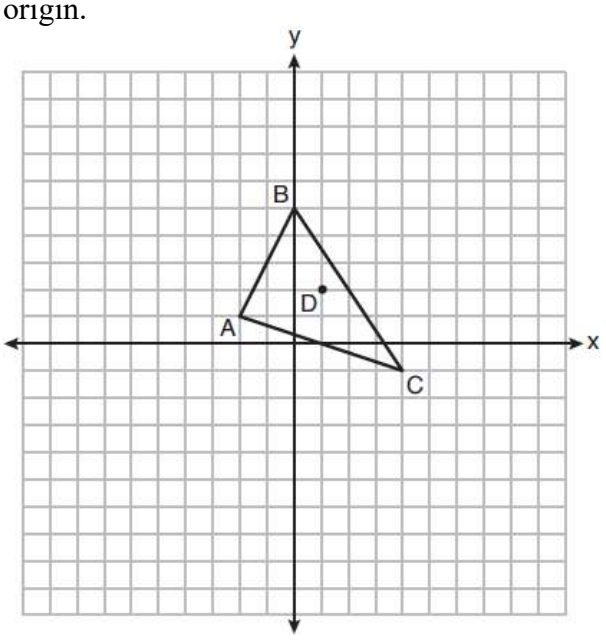
Name _____ Date _____
Mr. Schlansky Geometry

CCG Regents Review Homework

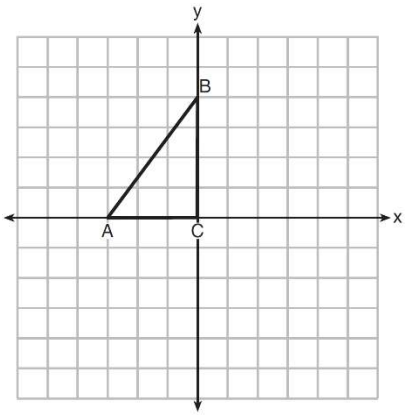
1. Triangle ABC and point $D(1, 2)$ are graphed on the set of axes below.
Graph and label $\triangle A'B'C'$, the image of $\triangle ABC$, after a dilation of scale factor 2 centered at point D.



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



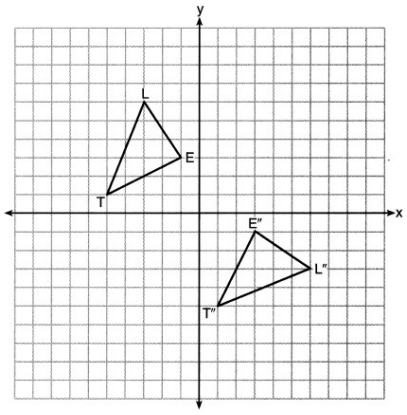
3. Triangle ABC is graphed on the set of axes below. Graph and label $\triangle A'B'C'$, the image of $\triangle ABC$ after a reflection over the line $x = 1$.



4. On the set of axes below, $\triangle LET$ and $\triangle L''E''T''$ are graphed in the coordinate plane where $\triangle LET \cong \triangle L''E''T''$.

Which sequence of rigid motions maps $\triangle LET$ onto $\triangle L''E''T''$?

1) a reflection over the *y*-axis followed by a reflection over the *x*-axis
2) a rotation of 180° about the origin
3) a rotation of 90° counterclockwise about the origin followed by a reflection over the *y*-axis
4) a reflection over the *x*-axis followed by a rotation of 90° clockwise about the origin

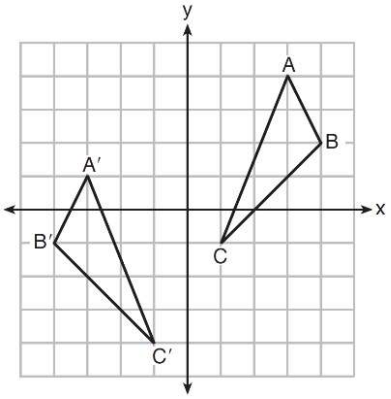


5. If $\triangle A'B'C'$ is the image of $\triangle ABC$, under which transformation will the triangles *not* be congruent?

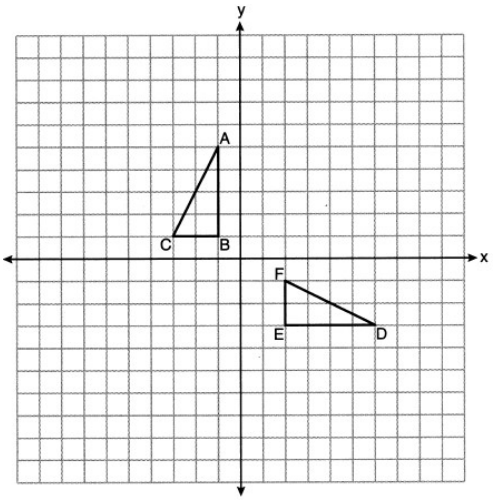
1) reflection over the *x*-axis
2) translation to the left 5 and down 4
3) dilation centered at the origin with scale factor 2
4) rotation of 270° counterclockwise about the origin

6. After a reflection over a line, $\Delta A'B'C'$ is the image of ΔABC. Explain why triangle ABC is congruent to triangle $\Delta A'B'C'$.

7. As graphed on the set of axes below, $\triangle A'B'C'$ is the image of $\triangle ABC$ after a sequence of transformations. Identify the sequences of transformations.
Is $\triangle A'B'C'$ congruent to $\triangle ABC$? Use the properties of rigid motion to explain your answer.

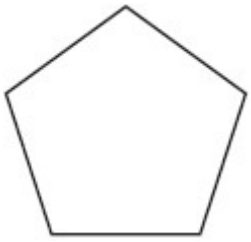


8. On the set of axes below, $\triangle ABC$ and $\triangle DEF$ are graphed. Describe a sequence of rigid motions that would map $\triangle ABC$ onto $\triangle DEF$.



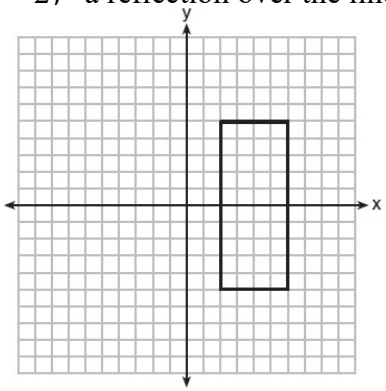
9. The regular polygon below is rotated about its center.
Which angle of rotation will carry the figure onto itself?

1) 60°
2) 108°
3) 216°
4) 540°



10. As shown in the graph below, the quadrilateral is a rectangle.
Which transformation would *not* map the rectangle onto itself?

1) a reflection over the x-axis
2) a reflection over the line $x = 4$
3) a rotation of 180° about the origin
4) a rotation of 180° about the point $(4, 0)$

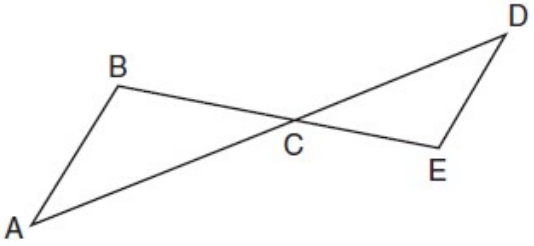


11. After a dilation with center $(0, 0)$, the image of $\overline{DB}$ is $\overline{D'B'}$. If $DB = 4.5$ and $D'B' = 18$, the scale factor of this dilation is

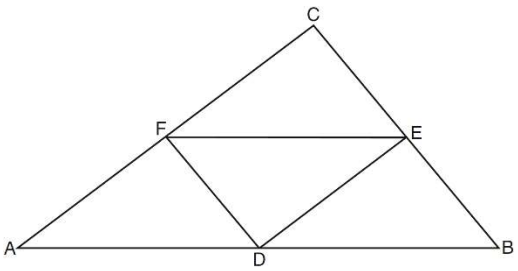
1) $\frac{1}{5}$
2) 5
3) $\frac{1}{4}$
4) 4

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

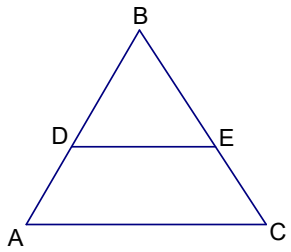
If $CD = 6.6$ cm, $DE = 3.4$ cm, $CE = 4.2$ cm, and $BC = 5.25$ cm, what is the length of $\overline{AC}$, to the *nearest hundredth of a centimeter*?



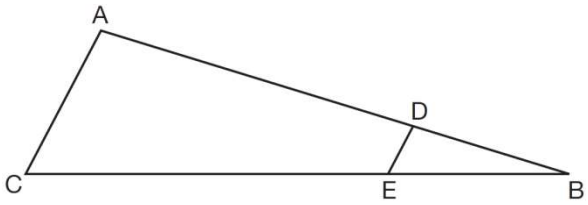
13. In the diagram of $\triangle ABC$ shown below, D is the midpoint of $\overline{AB}$, E is the midpoint of $\overline{BC}$, and F is the midpoint of $\overline{AC}$. If $AB = 20$, $BC = 12$, and $AC = 16$, what is the perimeter of trapezoid $ABEF$?



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



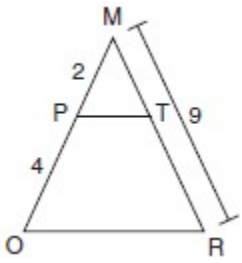
15. In the diagram of $\triangle ABC$, points D and E are on $\overline{AB}$ and $\overline{CB}$, respectively, such that $\overline{AC} \parallel \overline{DE}$.



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

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

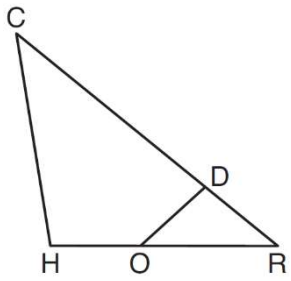
16. Given $\triangle MRO$ shown below, with trapezoid $PTRO$, $MR = 9$, $MP = 2$, and $PO = 4$.



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

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

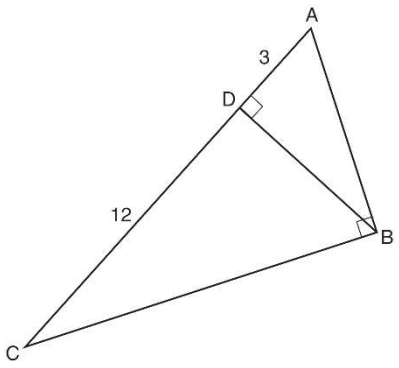
17. In triangle CHR, O is on $\overline{HR}$, and D is on $\overline{CR}$ so that $\angle H \cong RDO$. If $RD = 4$, $RO = 6$, and $OH = 4$, what is the length of $\overline{CD}$?



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

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

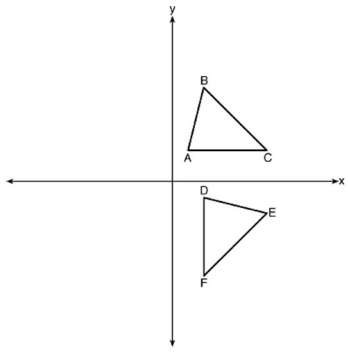
1) $5\sqrt{3}$
2) 6
3) $3\sqrt{5}$
4) 9



19. The image of ΔABC after a rotation of 90º clockwise about the origin is ΔDEF, as shown below.

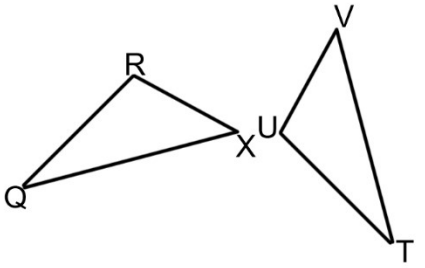
Which statement is true?

1) $\overline{BC} \cong \overline{DE}$
2) $\overline{AB} \cong \overline{DF}$
3) $\angle C \cong \angle E$
4) $\angle A \cong \angle D$



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

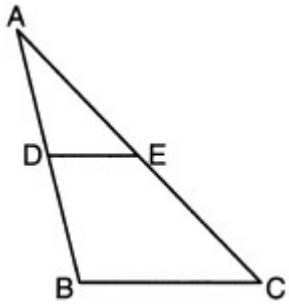
1) $\frac{\overline{QR}}{\overline{TU}} = \frac{\overline{QX}}{\overline{TV}}$
2) $\frac{\angle X}{\angle V} = \frac{\angle Q}{\angle T}$
3) $\frac{\overline{RX}}{\overline{UV}} = \frac{\overline{VT}}{\overline{XQ}}$
4) $\frac{\overline{QX}}{\overline{QR}} = \frac{\overline{TV}}{\overline{TU}}$



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

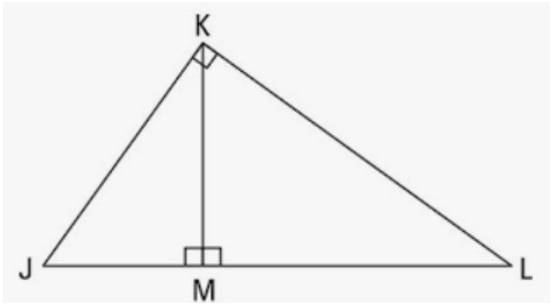
If $\overline{DE} \parallel \overline{BC}$, which equation will always be true?

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

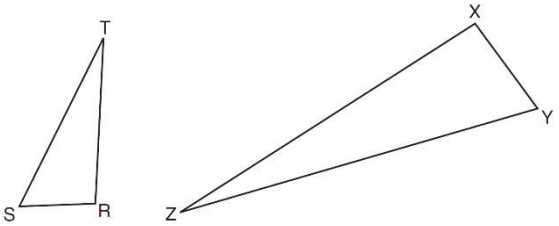


22. In right triangle JKL below, altitude $\overline{KM}$ is drawn to hypotenuse $\overline{JL}$. Which of the following proportions is *not* true?

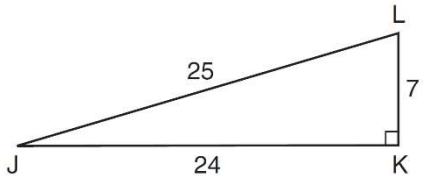
1) $\frac{\overline{JL}}{\overline{JK}} = \frac{\overline{JK}}{\overline{KM}}$
2) $\frac{\overline{JM}}{\overline{KM}} = \frac{\overline{KM}}{\overline{ML}}$
3) $\frac{\overline{JL}}{\overline{KL}} = \frac{\overline{KL}}{\overline{JM}}$
4) $\frac{\overline{ML}}{\overline{MK}} = \frac{\overline{MK}}{\overline{MJ}}$



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



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



Which statement is *not* true?

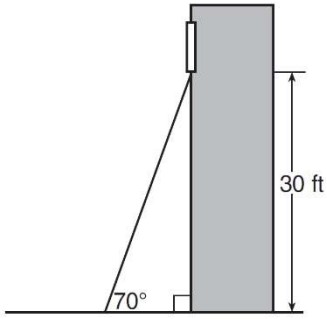
1) $\tan L = \frac{24}{7}$

2) $\cos L = \frac{24}{25}$

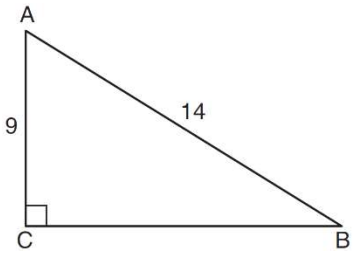
3) $\tan J = \frac{7}{24}$

4) $\sin J = \frac{7}{25}$

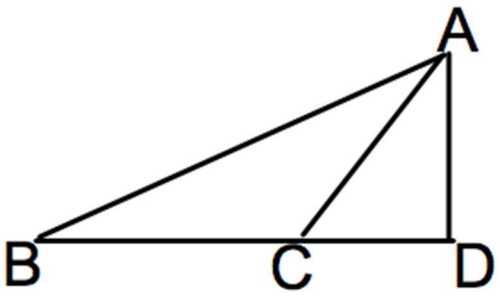
25. A carpenter leans an extension ladder against a house to reach the bottom of a window 30 feet above the ground. As shown in the diagram below, the ladder makes a 70° angle with the ground. To the *nearest foot*, determine and state the length of the ladder.



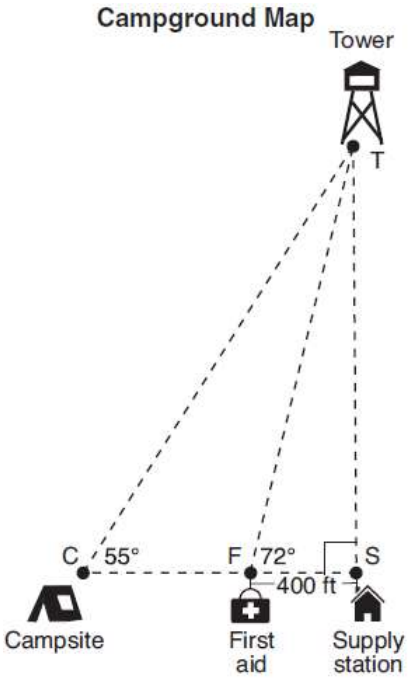
26. In the diagram of right triangle *ABC* shown below, $AB = 14$ and $AC = 9$.
What is the measure of $\angle A$, to the *nearest degree*?



27. In the diagram below, $m\angle CAD = 35$, $m\angle ABD = 42$, and $m\overline{AD} = 60$. Find to the nearest tenth, $m\overline{BC}$.



28. The map of a campground is shown below. Campsite *C*, first aid station *F*, and supply station *S* lie along a straight path. The path from the supply station to the tower, *T*, is perpendicular to the path from the supply station to the campsite. The length of path $\overline{FS}$ is 400 feet. The angle formed by path $\overline{TF}$ and path $\overline{FS}$ is 72°. The angle formed by path $\overline{TC}$ and path $\overline{CS}$ is 55°. Determine and state, to the *nearest foot*, the distance from the campsite to the tower.



29. In right triangle *ABC*, $m\angle C = 90°$. If $\cos B = \frac{5}{13}$, which function also equals $\frac{5}{13}$?

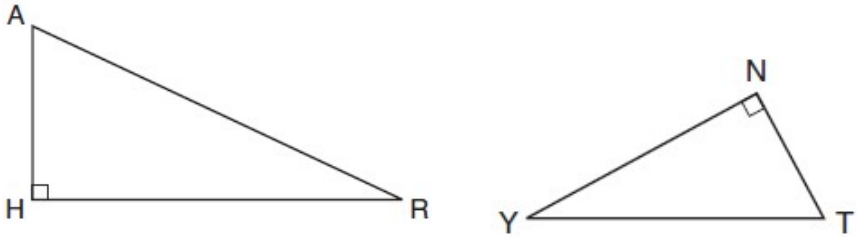
1) $\tan A$
2) $\tan B$
3) $\sin A$
4) $\sin B$

30. If $\sin(2x + 7)° = \cos(4x - 7)°$, what is the value of x?

1) 7
2) 15
3) 21
4) 30

31. 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*?

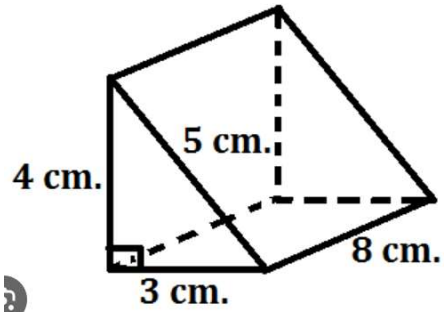
1) 23°
2) 25°
3) 65°
4) 67°



32. A plane intersects a hexagonal prism. The plane is perpendicular to the base of the prism. Which two-dimensional figure is the cross section of the plane intersecting the prism?

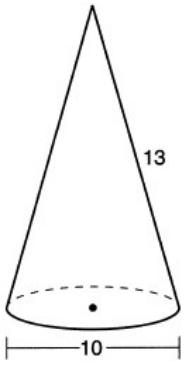
1) triangle
2) trapezoid
3) hexagon
4) rectangle

33. Find the volume of the triangular prism below:



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

35. Determine and state the volume of the cone, in terms of π.



36. The volume of a cylinder is 12,566.4 cm^3. The height of the cylinder is 8 cm. Find the radius of the cylinder to the *nearest tenth of a centimeter*.

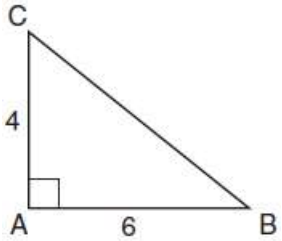
37. Town A has an area of 12 square miles. Town B has an area of 10 square miles. If town A has a population of 8,198 people and town B has a population of 7,384 people, which town has a greater population density? Justify your answer.

38. A brick that weighs 1824 grams has dimensions that measure 4 cm by 3 cm by 8 cm. To the nearest tenth, what is the density of the brick?

39. The paper towel roll shown below has a diameter of 8 inches and the paper has a thickness of 3 inches. If the height of the paper towel roll is 12 inches, what is the volume of the paper towels? Round your answer to the nearest tenth of a cubic inch.

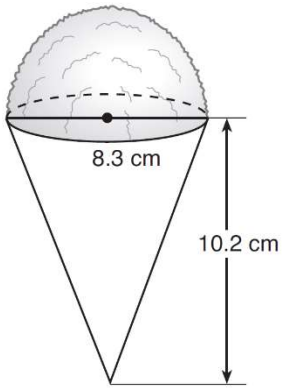
40. In the diagram below, right triangle ABC has legs whose lengths are 4 and 6.
What is the volume of the three-dimensional object formed by continuously rotating the right triangle around $\overline{AB}$?

1) 32π
2) 48π
3) 96π
4) 144π

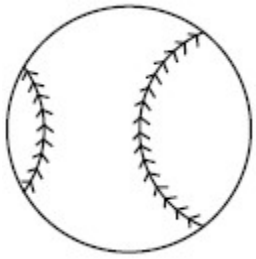


41. A child's tent can be modeled as a pyramid with a square base whose sides measure 60 inches and whose height measures 84 inches. What is the volume of the tent, to the *nearest cubic foot*?

42. 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, per kilogram, of ice is $3.83. Determine and state the cost of the ice needed to make 50 snow cones.



43. A packing box for baseballs is the shape of a rectangular prism with dimensions of $2\ ft \times 1\ ft \times 18\ in$. Each baseball has a diameter of 2.94 inches.
Determine and state the maximum number of baseballs that can be packed in the box if they are stacked in layers and each layer contains an equal number of baseballs. The weight of a baseball is approximately 0.025 pound per cubic inch. Determine and state, to the *nearest pound*, the total weight of all the baseballs in the fully packed box.



44. What are the coordinates of the center and length of the radius of the circle whose equation is $x^2 + 6x + y^2 - 4y = 23$?

1) $(3,-2)$ and 36
2) $(3,-2)$ and 6
3) $(-3,2)$ and 36
4) $(-3,2)$ and 6

45. What is an equation of the image of the line $y = \frac{3}{2}x - 4$ after a dilation of a scale factor of $\frac{3}{4}$ centered at the origin?

1) $y = \frac{9}{8}x - 4$
2) $y = \frac{9}{8}x - 3$
3) $y = \frac{3}{2}x - 4$
4) $y = \frac{3}{2}x - 3$

46. Line *MN* is dilated by a scale factor of 2 centered at the point $(0,6)$. If $\overleftrightarrow{MN}$ is represented by $y = -3x + 6$, which equation can represent $\overleftrightarrow{M'N'}$, the image of $\overleftrightarrow{MN}$?

1) $y = -3x + 12$
2) $y = -3x + 6$
3) $y = -6x + 12$
4) $y = -6x + 6$

47. 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) $y = -\frac{4}{3}x - 8$

48. 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?

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

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

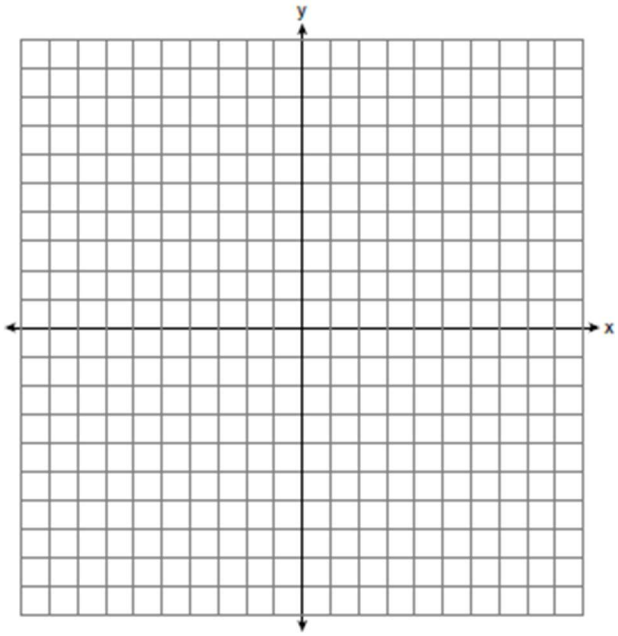
1) $y+1=-\frac{3}{2}(x-2)$

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

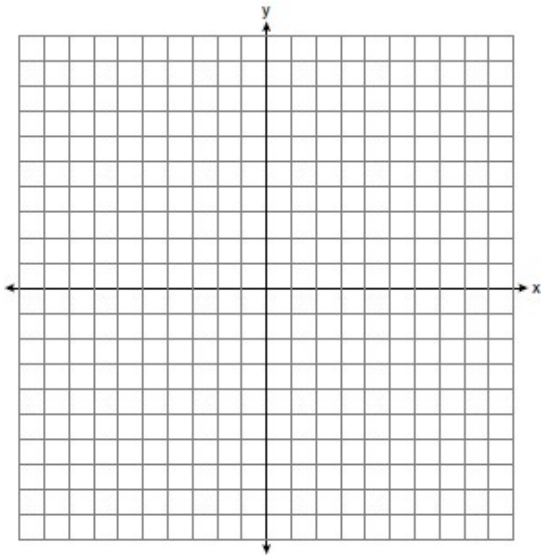
3) $y-1=-\frac{3}{2}(x+2)$

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

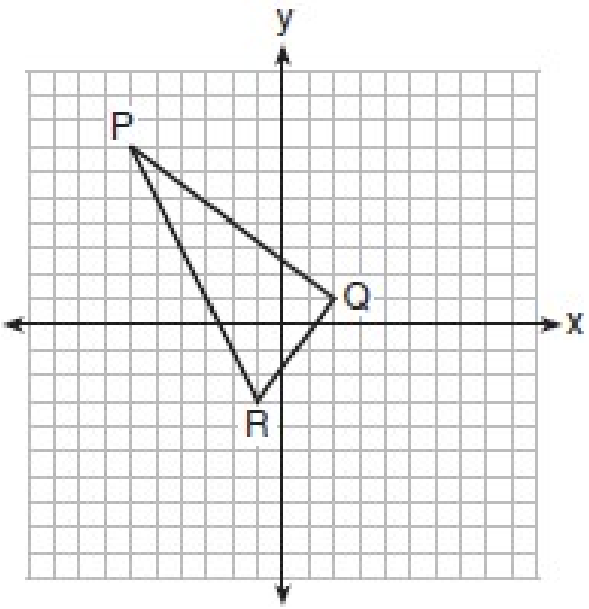
51. Write an equation of the perpendicular bisector of the line segment whose endpoints are (-4,3) and (4,5) in both point slope and slope intercept form.



52. Directed line segment *IQ* has endpoints whose coordinates are $I(-7,8)$ and $Q(-1,-4)$. Determine the coordinates of point *J* that divides the segment in the ratio 1 to 5.



53. On the set of axes below, the vertices of $\triangle PQR$ have coordinates $P(-6, 7)$, $Q(2, 1)$, and $R(-1, -3)$.

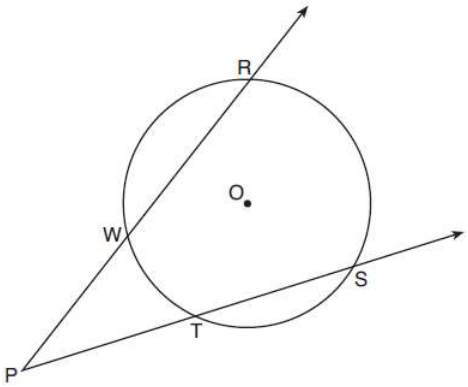


What is the area of $\triangle PQR$?

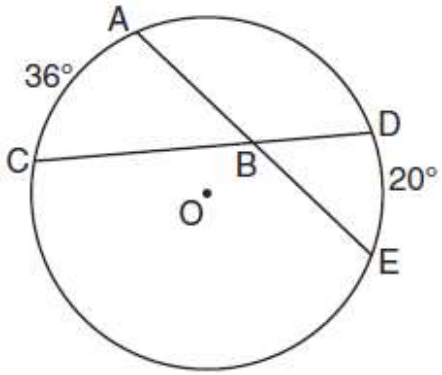
1) 10
2) 20
3) 25
4) 50

54. As shown in the diagram below, secants $\overrightarrow{PWR}$ and $\overrightarrow{PTS}$ are drawn to circle O from external point P.

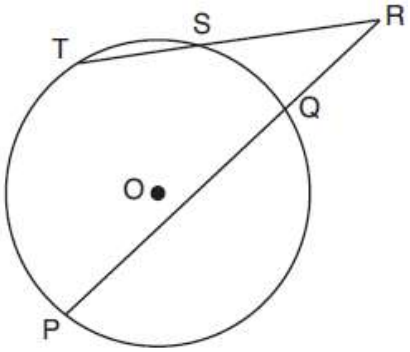
If $m\angle RPS = 35°$ and $m\overset{\frown}{RS} = 121°$, determine and state $m\overset{\frown}{WT}$.



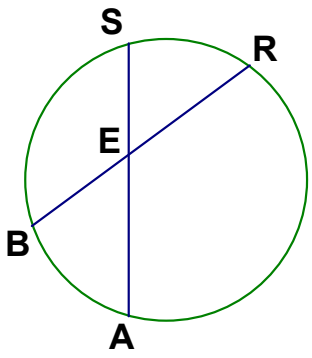
55. In the diagram below of circle O, chords $\overline{AE}$ and $\overline{DC}$ intersect at point B, such that $m\overset{\frown}{AC} = 36$ and $m\overset{\frown}{DE} = 20$. What is $m\angle ABC$?



56. 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 $\overline{RQ}$?



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



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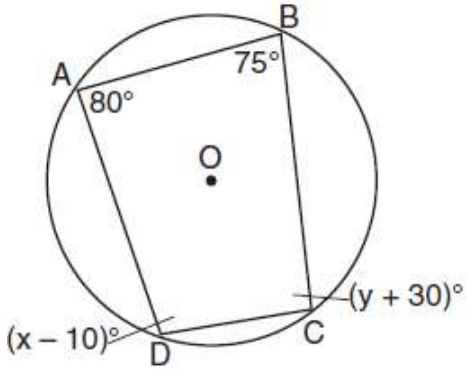
58. Diameter $\overline{ROQ}$ of circle O is extended through Q to point P, and tangent $\overline{PA}$ is drawn. If $m\overset{\frown}{RA} = 100°$, what is $m\angle P$?

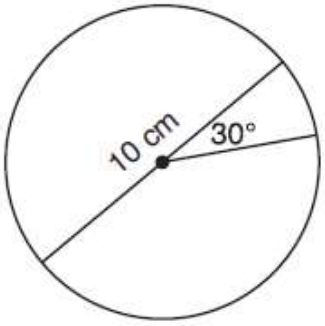
59. Quadrilateral *ABCD* is inscribed in circle *O*, as shown below.
If $m\angle A = 80°$, $m\angle B = 75°$, $m\angle C = (y + 30)°$, and $m\angle D = (x - 10)°$, which statement is true?

1) $x = 85$ and $y = 50$
2) $x = 90$ and $y = 45$
3) $x = 110$ and $y = 75$
4) $x = 115$ and $y = 70$

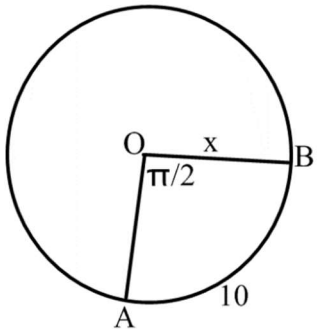


60. A circle with a diameter of 10 cm and a central angle of 30° is drawn below.
What is the area, to the *nearest tenth of a square centimeter*, of the sector formed by the 30° angle?

1) 5.2
2) 6.5
3) 13.1
4) 26.2



61. In circle O, the measure of central angle AOB is $\frac{\pi}{2}$ radians and the length of arc AB is 10 cm. What is the measure of radius $\overline{OB}$ to the *nearest tenth of a cm*?

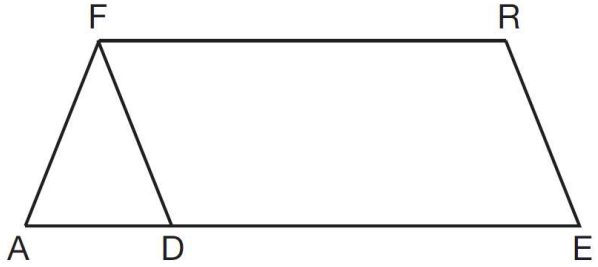


62. Given three distinct quadrilaterals, a square, a rectangle, and a rhombus, which quadrilaterals must have perpendicular diagonals?

1) the rhombus, only
2) the rectangle and the square
3) the rhombus and the square
4) the rectangle, the rhombus, and the square

63. A rhombus has diagonals that measure 6 and 8. Find the perimeter of the rhombus.

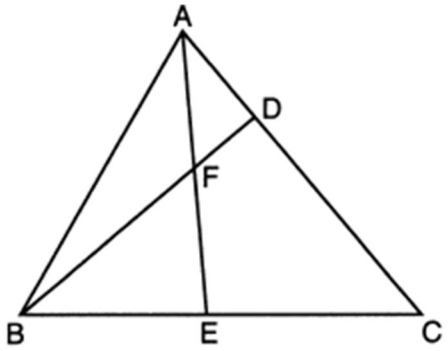
64. In the diagram of parallelogram *FRED* shown below. $\overline{ED}$ is extended to *A*. and $\overline{AF}$ is drawn such that $\overline{AF} \cong \overline{DF}$.



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

1) 124°
2) 112°
3) 68°
4) 56°

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



66. In ΔPQR, $\angle Q$ is the vertex angle. If $\angle Q = 94°$, find the measure of $\angle P$.

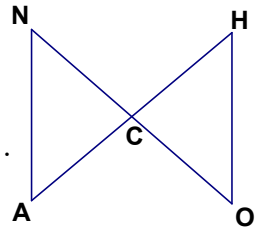
67. In $\triangle ABC$, side $\overline{BC}$ is extended through C to D. If $m\angle A = 30°$ and $m\angle ACD = 110°$, what is the longest side of $\triangle ABC$?

1) $\overline{AC}$
2) $\overline{BC}$
3) $\overline{AB}$
4) $\overline{CD}$

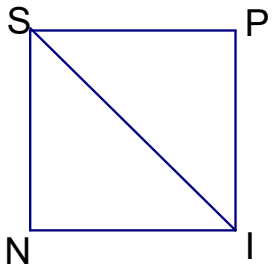
68. Triangles YEG and POM are two distinct non-right triangles such that $\angle G \cong \angle M$. Which statement is sufficient to prove $\triangle YEG$ is always congruent to $\triangle POM$?

1) $\angle E \cong \angle O$ and $\angle Y \cong \angle P$
2) $\overline{YG} \cong \overline{PM}$ and $\overline{YE} \cong \overline{PO}$
3) There is a sequence of rigid motions that maps $\angle E$ onto $\angle O$ and $\overline{YE}$ onto $\overline{PO}$.
4) There is a sequence of rigid motions that maps point Y onto point P and $\overline{YG}$ onto $\overline{PM}$.

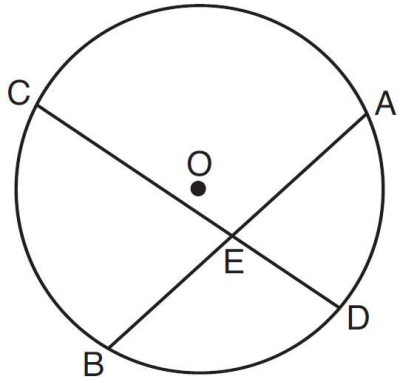
69. Given: $\overline{NO}$ and $\overline{HA}$ bisect each other
Prove: $\overline{NA} \cong \overline{HO}$



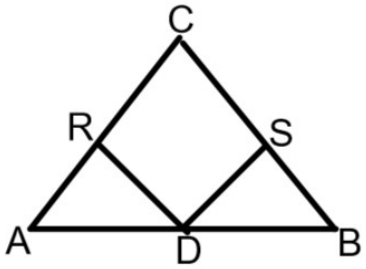
70. Given: SPIN is a square
Prove: $\Delta SNI \cong \Delta SPI$



71. 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 $AE \cdot EB = CE \cdot ED$.

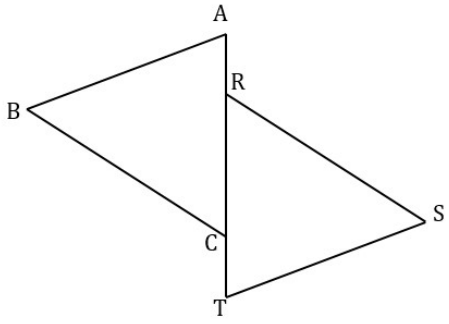


72. Given: In ΔABC, $\overline{CA} \cong \overline{CB}$, $\overline{AR} \cong \overline{BS}$, $\overline{DR} \perp \overline{AC}$, and $\overline{DS} \perp \overline{BC}$
Prove: $\overline{DR} \cong \overline{DS}$

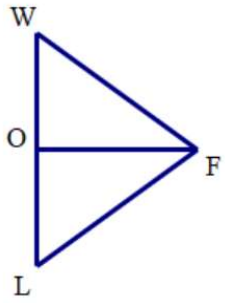


73. Given: $\angle B \cong \angle S$, $\overline{AB} \parallel \overline{ST}$, $\overline{AR} \cong \overline{TC}$

Prove: $\overline{BC} \cong \overline{SR}$



74. Given: $\overline{OF}$ is the perpendicular bisector of $\overline{WL}$
Prove: ΔWFL is isosceles



75.
a) Name the two ways to prove a parallelogram is a rectangle.

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

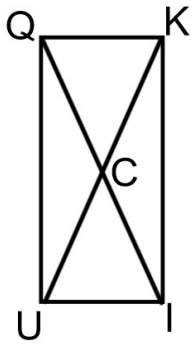
76. A parallelogram must be a rectangle when its
1) diagonals are perpendicular
2) diagonals are congruent
3) opposite sides are parallel
4) opposite sides are congruent

77. In parallelogram *ABCD*, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at *E*. Which statement does *not* prove parallelogram *ABCD* is a rhombus?
1) $\overline{AC} \cong \overline{DB}$
2) $\overline{AB} \cong \overline{BC}$
3) $\overline{AC} \perp \overline{DB}$
4) $\overline{AC}$ bisects $\angle DCB$

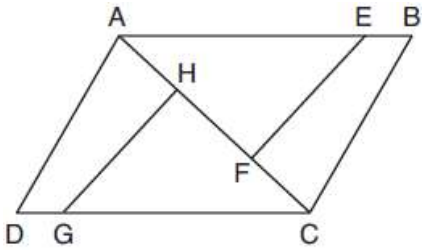
78. Quadrilateral *ABCD* has diagonals $\overline{AC}$ and $\overline{BD}$. Which information is *not* sufficient to prove *ABCD* is a parallelogram?

1) $\overline{AC}$ and $\overline{BD}$ bisect each other.
2) $\overline{AB} \cong \overline{CD}$ and $\overline{BC} \cong \overline{AD}$
3) $\overline{AB} \cong \overline{CD}$ and $\overline{AB} \parallel \overline{CD}$
4) $\overline{AB} \cong \overline{CD}$ and $\overline{BC} \parallel \overline{AD}$

79. Given: QUIK is a parallelogram, $\overline{QI} \cong \overline{KU}$
Prove: QUIK is a rectangle



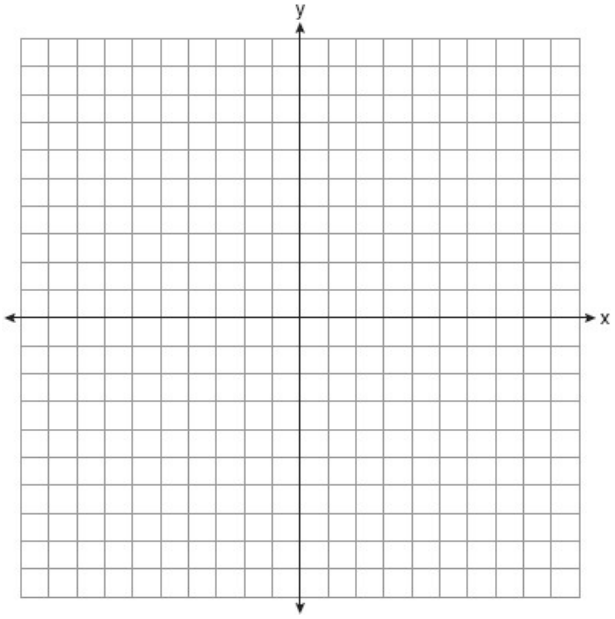
80. In the diagram of quadrilateral *ABCD* with diagonal $\overline{AC}$ shown below, segments *GH* and *EF* are drawn, $\overline{AE} \cong \overline{CG}$, $\overline{BE} \cong \overline{DG}$, $\overline{AH} \cong \overline{CF}$, and $\overline{AD} \cong \overline{CB}$. Prove: $\overline{EF} \cong \overline{GH}$



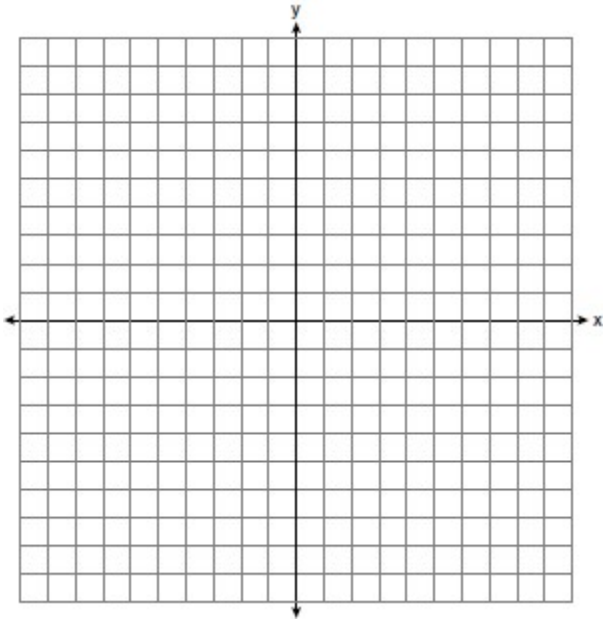
81. Segment AB is the perpendicular bisector of $\overline{CD}$ at point M. Which statement is always true?

1) $\overline{CB} \cong \overline{DB}$
2) $\overline{CD} \cong \overline{AB}$
3) $\triangle ACD \sim \triangle BCD$
4) $\triangle ACM \sim \triangle BCM$

82. 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.]

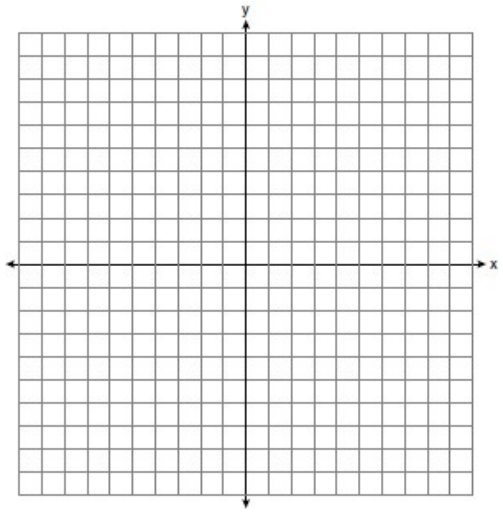


83. In the coordinate plane, the vertices of $\triangle RST$ are $R(6,-1)$, $S(1,-4)$, and $T(-5,6)$. Prove that $\triangle RST$ is a right triangle. State the coordinates of point P such that quadrilateral $RSTP$ is a rectangle. Prove that your quadrilateral $RSTP$ is a rectangle.



84. Parallelogram QRST has coordinates Q(-3,2) and S(6,0). Which statement would prove that QRST is a rectangle?

1) The slope of $\overline{RT}$ is $\frac{9}{2}$
2) The length of $\overline{RT}$ is $\sqrt{85}$
3) The midpoint of $\overline{RT}$ is (1.5,1)
4) $\overline{QR} \cong \overline{ST}$



85. 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.