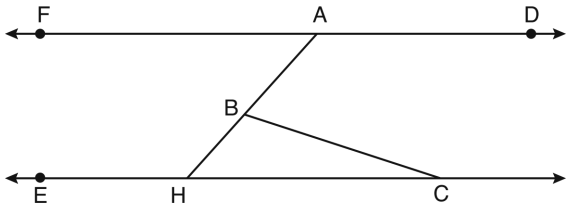
Geometry CC Review Packet #1

Mrs. Ebert **Show all work**

Name: _____ **Date:** _____

1. In the diagram below, $\overleftrightarrow{FAD} \parallel \overleftrightarrow{EHC}$, and $\overline{ABH}$ and $\overline{BC}$ and are drawn.



If $m\angle FAB = 48^\circ$ and $m\angle ECB = 18^\circ$, what is $m\angle ABC$?

A. 18° B. 48° C. 66° D. 114°

2. A cone has a volume of 108π and a base diameter of 12. What is the height of the cone?

A. 27 B. 9 C. 3 D. 4

3. Triangle JGR is similar to triangle MST. Which statement is *not* always true?

A. $\angle J \cong \angle M$ B. $\angle G \cong \angle T$

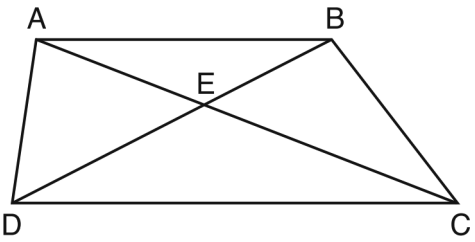
C. $\angle R \cong \angle T$ D. $\angle G \cong \angle S$

4. In parallelogram $ABCD$, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at E. Which statement proves $ABCD$ is a rectangle?

A. $\overline{AC} \cong \overline{BD}$ B. $\overline{AB} \perp \overline{BD}$

C. $\overline{AC} \perp \overline{BD}$ D. $\overline{AC}$ bisects $\angle BCD$

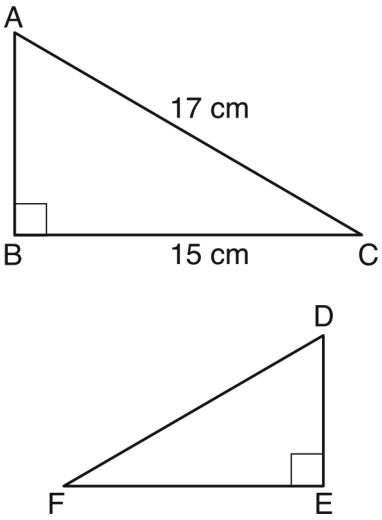
5. In trapezoid $ABCD$ below, $\overline{AB} \parallel \overline{CD}$.



If $AE = 5.2$, $AC = 11.7$, and $CD = 10.5$, what is the length of $\overline{AB}$, to the *nearest tenth*?

A. 4.7 B. 6.5 C. 8.4 D. 13.1

6. Kayla was cutting right triangles from wood to use for an art project. Two of the right triangles she cut are shown below.



If $\triangle ABC \sim \triangle DEF$, with right angles B and E, $BC = 15$ cm, and $AC = 17$ cm, what is the measure of $\angle F$, to the *nearest degree*?

A. 28° B. 41° C. 62° D. 88°

7. The line represented by $2y = x + 8$ is dilated by a scale factor of k centered at the origin, such that the image of the line has an equation of $y - \frac{1}{2}x = 2$. What is the scale factor?

A. $k = \frac{1}{2}$ B. $k = 2$ C. $k = \frac{1}{4}$ D. $k = 4$

8. Jaden is comparing two cones. The radius of the base of cone A is twice as large as the radius of the base of cone B. The height of cone B is twice the height of cone A. The volume of cone A is

A. twice the volume of cone B

B. four times the volume of cone B

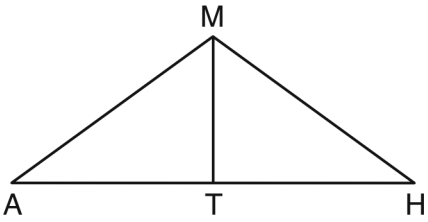
C. equal to the volume of cone B

D. equal to half the volume of cone B

9. A regular hexagon is rotated about its center. Which degree measure will carry the regular hexagon onto itself?

A. 45° B. 90° C. 120° D. 135°

10. In triangle MAH below, $\overline{MT}$ is the perpendicular bisector of $\overline{AH}$.



Which statement is *not* always true?

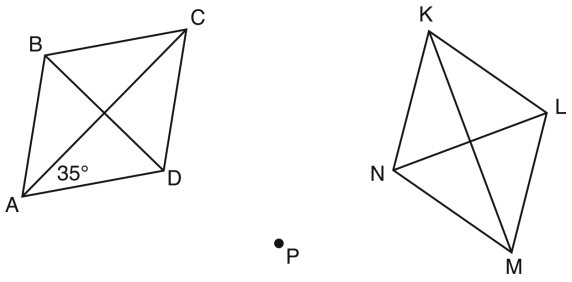
A. $\triangle MAH$ is isosceles.

B. $\triangle MAT$ is isosceles.

C. $\overline{MT}$ bisects $\angle AMH$.

D. $\angle A$ and $\angle TMH$ are complementary.

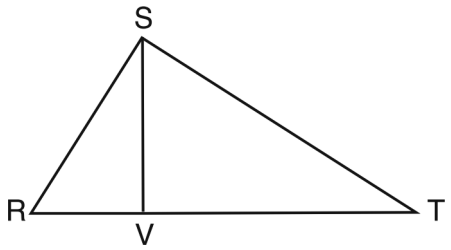
11. Rhombus *ABCD* can be mapped onto rhombus *KLMN* by a rotation about point *P*, as shown below.



What is the measure of $\angle KNM$ if the measure of $\angle CAD = 35°$?

A. $35°$ B. $55°$ C. $70°$ D. $110°$

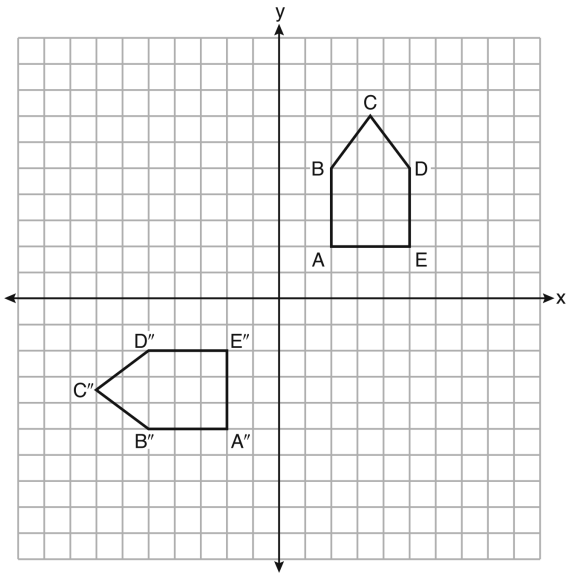
12. In right triangle *RST* below, altitude $\overline{SV}$ is drawn to hypotenuse $\overline{RT}$



If $RV = 4.1$ and $TV = 10.2$, what is the length of $\overline{ST}$, to the *nearest tenth*?

A. 6.5 B. 7.7 C. 11.0 D. 12.1

13. 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 $A''B''C''D''E''$?

A. a rotation of $90°$ counterclockwise about the origin followed by a reflection over the *x*-axis

B. a rotation of $90°$ counterclockwise about the origin followed by a translation down 7 units

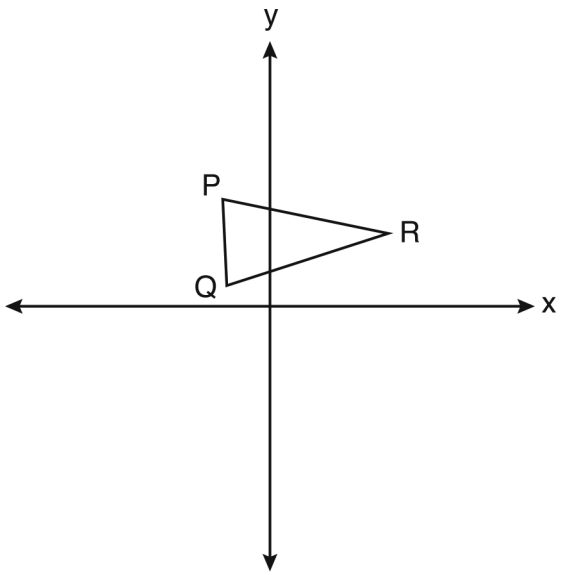
C. a reflection over the *y*-axis followed by a reflection over the *x*-axis

D. a reflection over the *x*-axis followed by a rotation of $90°$ counterclockwise about the origin

14. For the acute angles in a right triangle, $\sin(4x)° = \cos(3x + 13)°$. What is the number of degrees in the measure of the *smaller* angle?

A. $11°$ B. $13°$ C. $44°$ D. $52°$

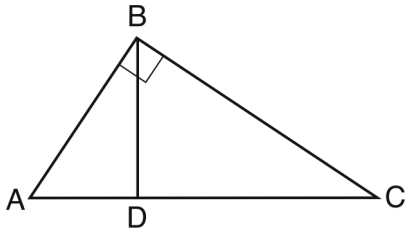
15. Triangle PQR is shown on the set of axes below.



Which quadrant will contain point R'', the image of point R, after a 90° clockwise rotation centered at $(0, 0)$ followed by a reflection over the x-axis?

A. I B. II C. III D. IV

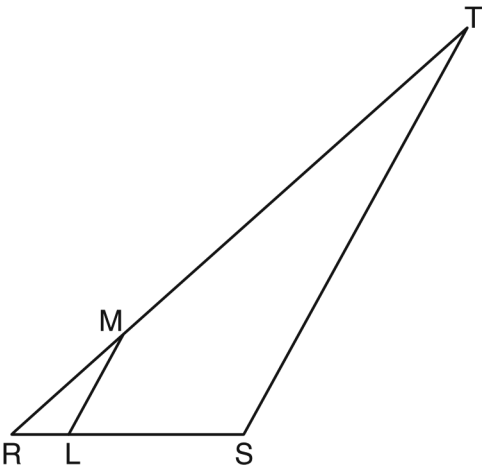
16. In the diagram below of right triangle ABC, altitude $\overline{BD}$ is drawn.



Which ratio is always equivalent to $\cos A$?

A. $\frac{AB}{BC}$ B. $\frac{BD}{BC}$ C. $\frac{BD}{AB}$ D. $\frac{BC}{AC}$

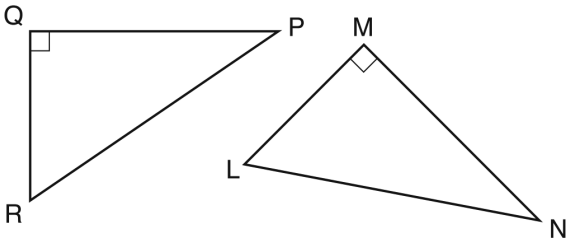
17. In the diagram below of $\triangle RST$, L is a point $\overline{RS}$, and M is a point on $\overline{RT}$, such that $\overline{LM} \parallel \overline{ST}$



If $RL = 2$, $LS = 6$, $LM = 4$, and $ST = x + 2$, what is the length of $\overline{ST}$?

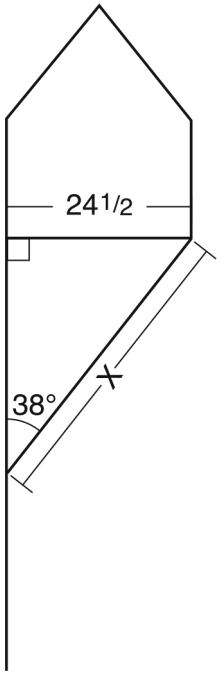
A. 10 B. 12 C. 14 D. 16

18. In the diagram below, right triangle PQR is transformed by a sequence of rigid motions that maps it onto right triangle NML.



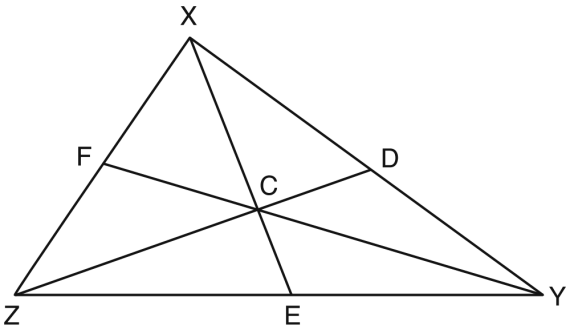
Write a set of three congruency statements that would show ASA congruency for these triangles.

19. Diego needs to install a support beam to hold up his new birdhouse, as modeled below. The base of the birdhouse is $24\frac{1}{2}$ inches long. The support beam will form an angle of 38° with the vertical post. Determine and state the approximate length of the support beam, x, to the *nearest inch*.



20. Given $\overline{MT}$ below, use a compass and straightedge to construct a 45° angle whose vertex is at point M.

21. In $\triangle XYZ$ shown below, medians $\overline{XE}$, $\overline{YF}$, and $\overline{ZD}$ intersect at C.

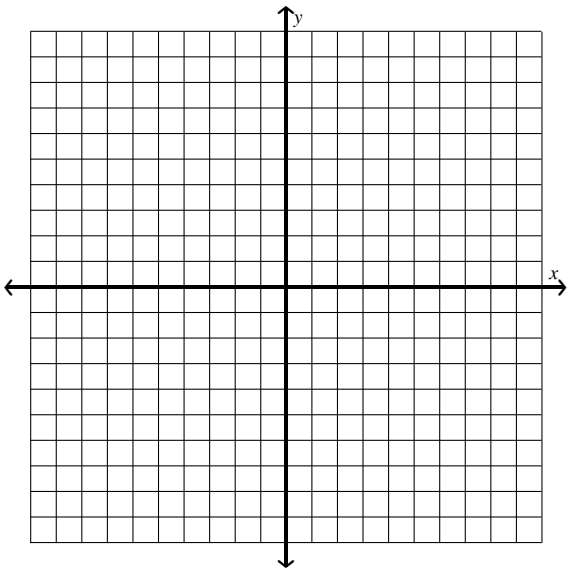


If $CE = 5$, $YF = 21$, and $XZ = 15$, determine and state the perimeter of triangle CFX.

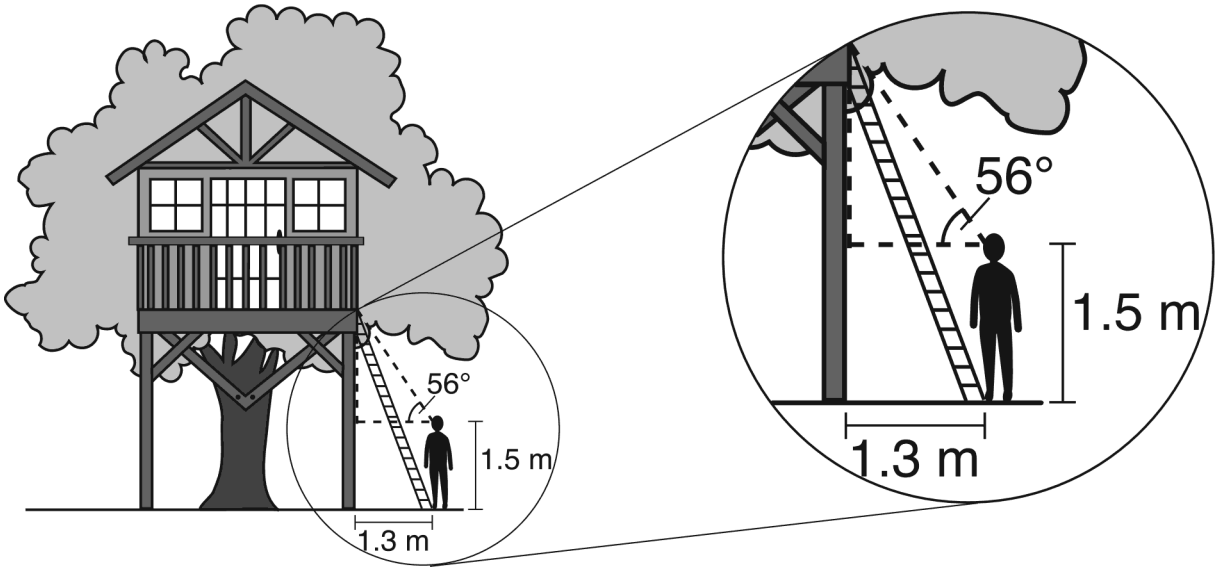
22. Determine and state an equation of the line perpendicular to the line $5x - 4y = 10$ and passing through the point $(5, 12)$.

23. Quadrilateral $NATS$ has coordinates $N(-4, -3)$, $A(1, 2)$, $T(8, 1)$, and $S(3, -4)$.

Prove quadrilateral $NATS$ is a rhombus.

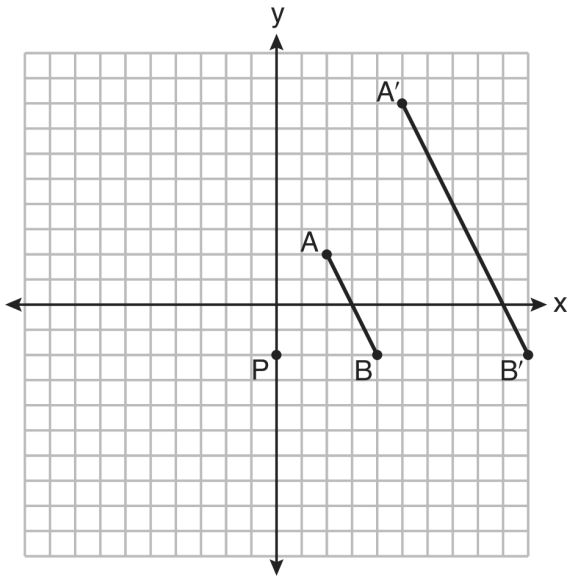


24. David has just finished building his treehouse and still needs to buy a ladder to be attached to the ledge of the treehouse and anchored at a point on the ground, as modeled below. David is standing 1.3 meters from the stilt supporting the treehouse. This is the point on the ground where he has decided to anchor the ladder. The angle of elevation from his eye level to the bottom of the treehouse is 56 degrees. David's eye level is 1.5 meters above the ground.



Determine and state the minimum length of a ladder, to the *nearest tenth of a meter*, that David will need to buy for his treehouse.

25. On the set of axes below, $\overline{AB}$ is dilated by a scale factor of $\frac{5}{2}$ centered at point P.



Which statement is always true?

A. $\overline{PA} \cong \overline{AA'}$ B. $\overline{AB} \parallel \overline{A'B'}$

C. $AB = A'B'$ D. $\frac{5}{2}(A'B') = AB$

26. The coordinates of the vertices of parallelogram $CDEH$ are $C(-5, 5)$, $D(2, 5)$, $E(-1, -1)$, and $H(-8, -1)$. What are the coordinates of P, the point of intersection of diagonals $\overline{CE}$ and $\overline{DH}$?

A. $(-2, 3)$ B. $(-2, 2)$

C. $(-3, 2)$ D. $(-3, -2)$

27. If the altitudes of a triangle meet at one of the triangle's vertices, then the triangle is

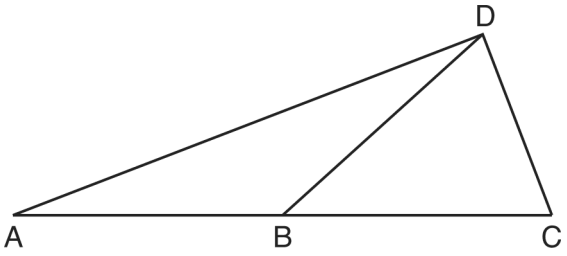
A. a right triangle

B. an acute triangle

C. an obtuse triangle

D. an equilateral triangle

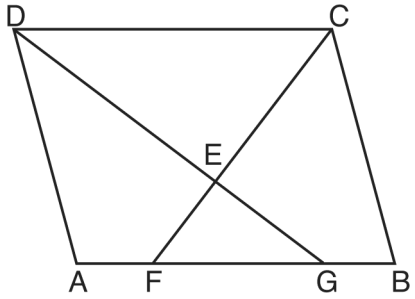
28. In the diagram below of $\triangle ACD$, $\overline{DB}$ is a median to $\overline{AC}$, and $\overline{AB} \cong \overline{DB}$.



If $m\angle DAB = 32°$, what is $m\angle BDC$?

A. 32° B. 52° C. 58° D. 64°

29. In the diagram below of parallelogram $ABCD$, $\overline{AFGB}$, $\overline{CF}$ bisects $\angle DCB$, $\overline{DG}$ bisects $\angle ADC$, and $\overline{CF}$ and $\overline{DG}$ intersect at E.



If $m\angle B = 75°$, then the measure of $\angle EFA$ is

A. $142.5°$ B. $127.5°$

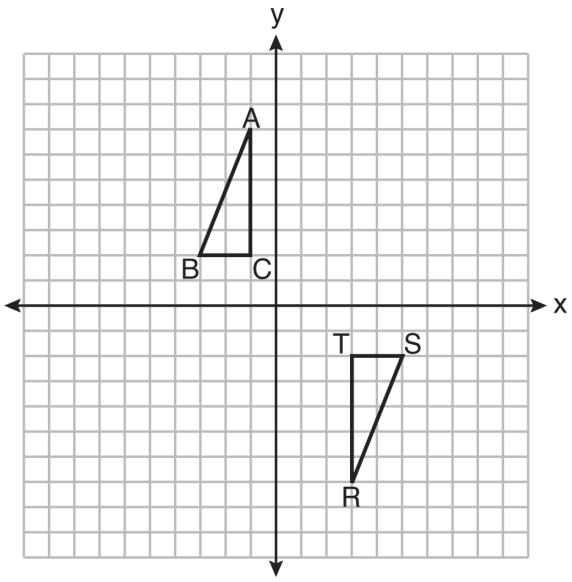
C. $52.5°$ D. $37.5°$

30. What is an equation of a line that is perpendicular to the line whose equation is $2y + 3x = 1$?

A. $y = \frac{2}{3}x + \frac{5}{2}$ B. $y = \frac{3}{2}x + 2$

C. $y = -\frac{2}{3}x + 1$ D. $y = -\frac{3}{2}x + \frac{1}{2}$

31. Triangles ABC and RST are graphed on the set of axes below.



Which sequence of rigid motions will prove $\triangle ABC \cong \triangle RST$?

A. a line reflection over $y = x$

B. a rotation of $180°$ centered at $(1, 0)$

C. a line reflection over the x-axis followed by a translation of 6 units right

D. a line reflection over the x-axis followed by a line reflection over $y = 1$

32. If the line represented by $y = -\frac{1}{4}x - 2$ is dilated by a scale factor of 4 centered at the origin, which statement about the image is true?

A. The slope is $-\frac{1}{4}$ and the y-intercept is -8.

B. The slope is $-\frac{1}{4}$ and the y-intercept is -2.

C. The slope is -1 and the y-intercept is -8.

D. The slope is -1 and the y-intercept is -2.

33. In quadrilateral $QRST$, diagonals $\overline{QS}$ and $\overline{RT}$ intersect at M. Which statement would always prove quadrilateral $QRST$ is a parallelogram?

A. $\angle TQR$ and $\angle QRS$ are supplementary.

B. $\overline{QM} \cong \overline{SM}$ and $\overline{QT} \cong \overline{RS}$

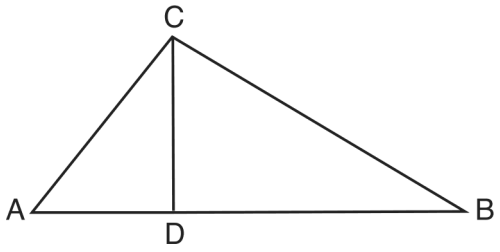
C. $\overline{QR} \cong \overline{TS}$ and $\overline{QT} \cong \overline{RS}$

D. $\overline{QR} \cong \overline{TS}$ and $\overline{QT} \parallel \overline{RS}$

34. Chelsea is sitting 8 feet from the foot of a tree. From where she is sitting, the angle of elevation of her line of sight to the top of the tree is 36°. If her line of sight starts 1.5 feet above ground, how tall is the tree, to the *nearest foot*?

A. 8 B. 7 C. 6 D. 4

35. In the diagram below of right triangle ABC, altitude $\overline{CD}$ intersects hypotenuse $\overline{AB}$ at D.

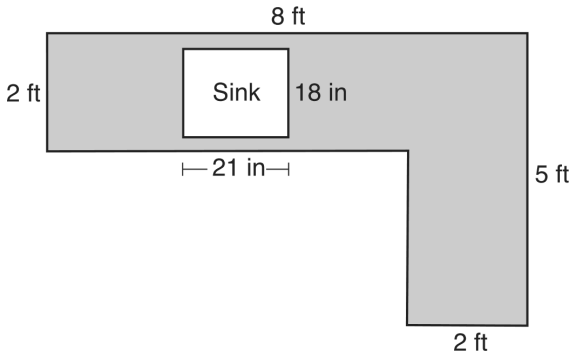


Which equation is always true?

A. $\frac{AD}{AC} = \frac{CD}{BC}$ B. $\frac{AD}{CD} = \frac{BD}{CD}$

C. $\frac{AC}{CD} = \frac{BC}{CD}$ D. $\frac{AD}{AC} = \frac{AC}{BD}$

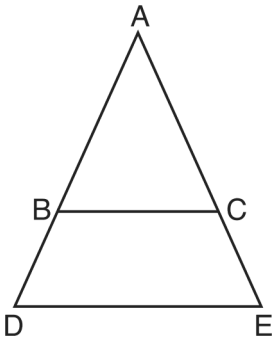
36. A countertop for a kitchen is modeled with the dimensions shown below. An 18-inch by 21-inch rectangle will be removed for the installation of the sink.



What is the area of the top of the installed countertop, to the *nearest square foot*?

A. 26 B. 23 C. 22 D. 19

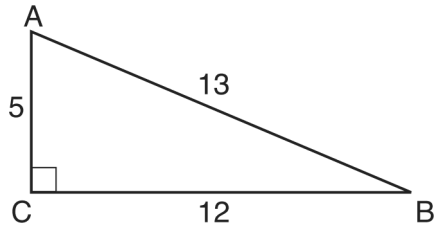
37. In the diagram below, $\overline{BC}$ connects points B and C on the congruent sides of isosceles triangle ADE, such that $\triangle ABC$ is isosceles with vertex angle A.



If $AB = 10$, $BD = 5$, and $DE = 12$, what is the length of $\overline{BC}$?

A. 6 B. 7 C. 8 D. 9

38. In $\triangle ABC$ below, angle C is a right angle.



Which statement must be true?

A. $\sin A = \cos B$ B. $\sin A = \tan B$

C. $\sin B = \tan A$ D. $\sin B = \cos B$

39. In right triangle RST, altitude $\overline{TV}$ is drawn to hypotenuse $\overline{RS}$. If $RV = 12$ and $RT = 18$, what is the length of $\overline{SV}$?

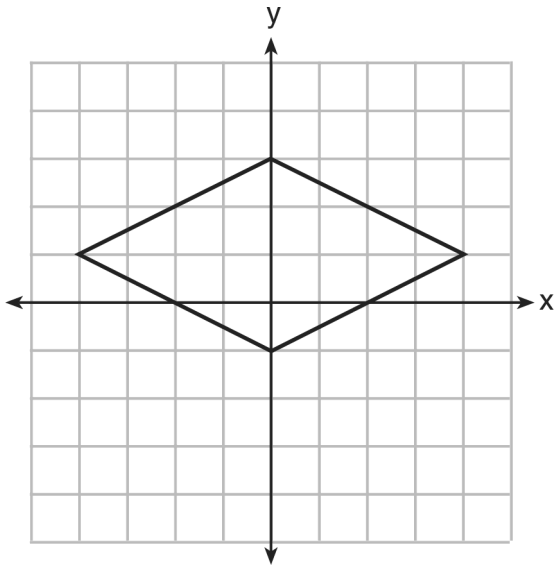
A. $6\sqrt{5}$ B. 15 C. $6\sqrt{6}$ D. 27

40. What is the volume, in cubic centimeters, of a right square pyramid with base edges that are 64 cm long and a slant height of 40 cm?

A. 8192.0 B. $13,653.\overline{3}$

C. 32,768.0 D. $54,613.\overline{3}$

41. A rhombus is graphed on the set of axes below.



Which transformation would carry the rhombus onto itself?

A. 180° rotation counterclockwise about the origin

B. reflection over the line $y = \frac{1}{2}x + 1$

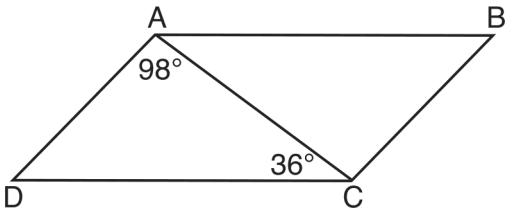
C. reflection over the line $y = 0$

D. reflection over the line $x = 0$

42. A 15-foot ladder leans against a wall and makes an angle of 65° with the ground. What is the horizontal distance from the wall to the base of the ladder, to the *nearest tenth of a foot*?

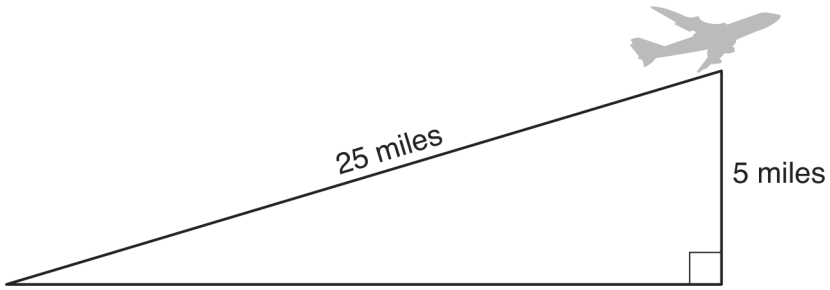
A. 6.3 B. 7.0 C. 12.9 D. 13.6

43. In parallelogram $ABCD$ shown below, $m\angle DAC = 98^\circ$ and $m\angle ACD = 36^\circ$.



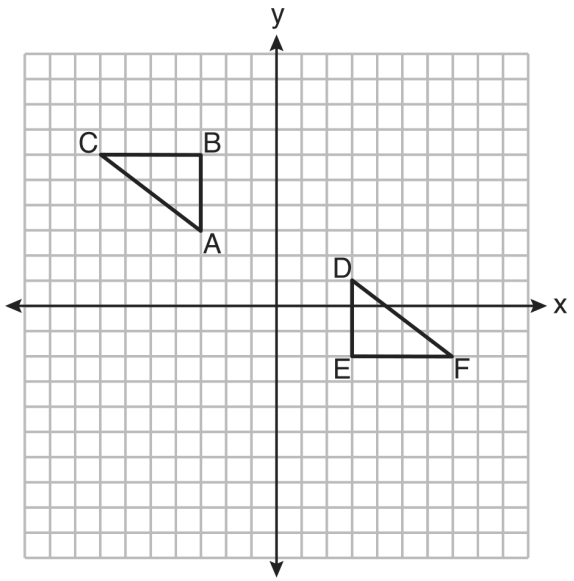
What is the measure of angle B? Explain why.

44. An airplane took off at a constant angle of elevation. After the plane traveled for 25 miles, it reached an altitude of 5 miles, as modeled below.



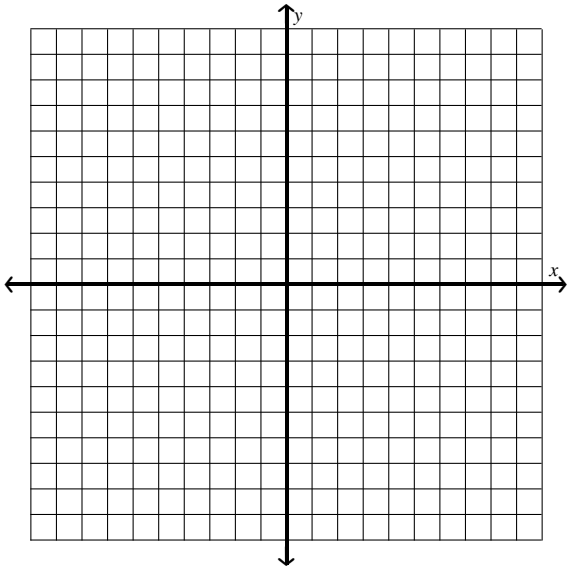
To the *nearest tenth of a degree*, what was the angle of elevation?

45. On the set of axes below, $\triangle ABC \cong \triangle DEF$.

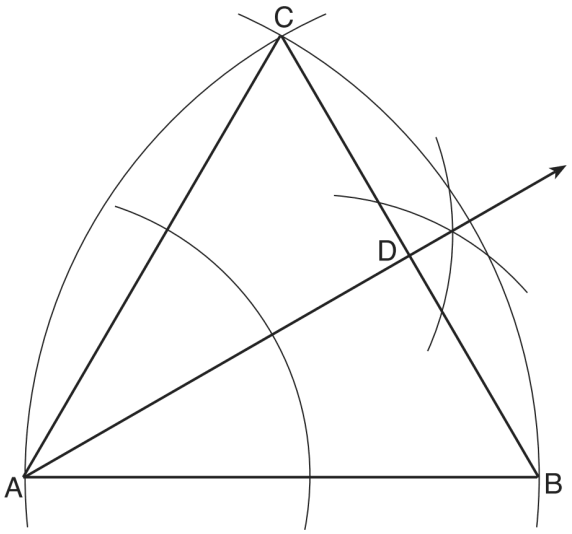


Describe a sequence of rigid motions that maps $\triangle ABC$ onto $\triangle DEF$.

46. The vertices of $\triangle ABC$ have coordinates $A(-2,-1)$, $B(10,-1)$, and $C(4,4)$. Determine and state the area of $\triangle ABC$.

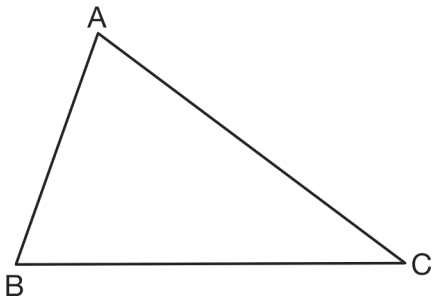


47. Using the construction below, state the degree measure of $\angle CAD$. Explain why.



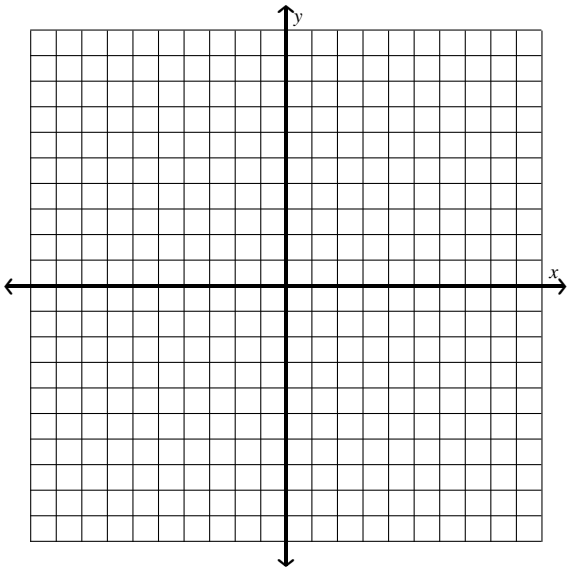
48. A large water basin is in the shape of a right cylinder. The inside of the basin has a diameter of $8\frac{1}{4}$ feet and a height of 3 feet. Determine and state, to the *nearest cubic foot*, the number of cubic feet of water that it will take to fill the basin to a level of $\frac{1}{2}$ foot from the top.

49. Triangle ABC is shown below. Construct the dilation of $\triangle ABC$ centered at B with a scale factor of 2.



Is the image of $\triangle ABC$ similar to the original triangle? Explain why.

50. 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.