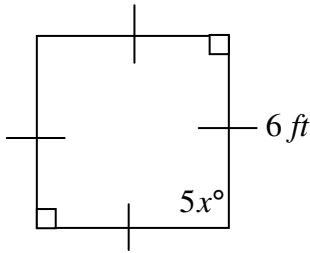


Advanced Geometry
Free Response Final Review

Name key

1. Find the value of x and the perimeter.



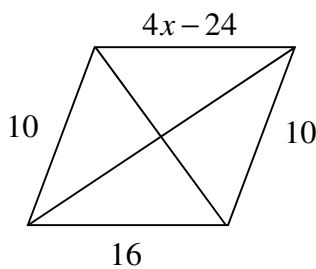
$$5x = 90 \quad P = 4(6)$$

$$x = 18 \quad P = 24$$

$$x = \underline{18}$$

$$\text{Perimeter} = \underline{24 \text{ ft}}$$

2. Find x and the perimeter of the parallelogram below.



$$4x - 24 = 16 \quad P = 10 + 10 + 16 + 16$$

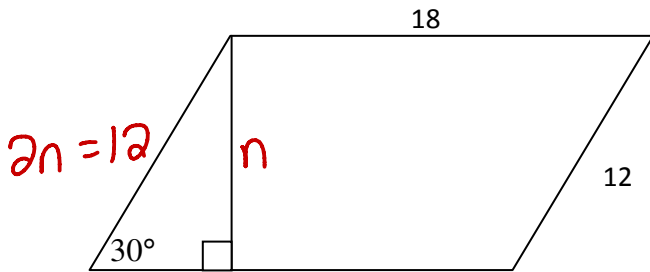
$$4x = 40 \quad P = 52$$

$$x = 10$$

$$x = \underline{10}$$

$$\text{Perimeter} = \underline{52}$$

3. Determine the area of the parallelogram.

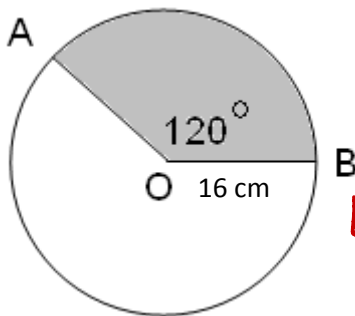


$$2n = 12 \quad A = 18(6)$$

$$n = 6 \quad A = 108$$

$$\text{Area} = \underline{108}$$

4. Calculate the area of the sector and find the length of \widehat{AB} (cm).



$$A = \frac{120}{360} \cdot \pi (16)^2$$

$$= 268.1$$

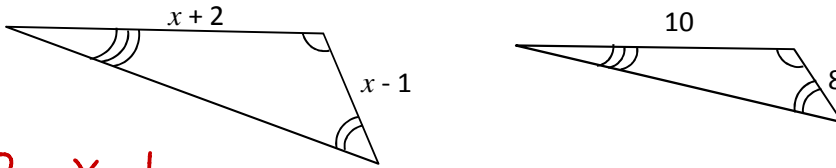
$$\text{Area of the Sector} = \underline{268.1 \text{ cm}^2}$$

$$\text{Length} = \frac{120}{360} \cdot 2\pi (16)$$

$$= 33.5$$

$$\text{Length of } \widehat{AB} \text{ (cm)} = \underline{33.5 \text{ cm}}$$

5. Are the triangles similar? Why or why not. If they are similar, find x .



$$\frac{x+2}{10} = \frac{x-1}{8}$$

$$8(x+2) = 10(x-1)$$

$$8x+16 = 10x-10$$

$$16 = 2x - 10 \rightarrow 2x = 26 \rightarrow x = 13$$

Are the triangles similar (circle one)? YES / NO

$$x = \underline{13}$$

AA~

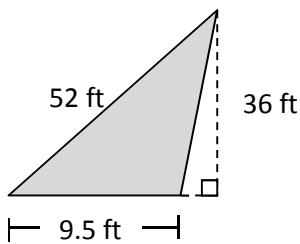
6. You are going to paint a 10 ft x 78 ft wall at your school. One gallon of paint covers 50 ft². If you must buy the paint by the gallon, how many gallons will you buy?

$$A = 10(78) = 780 \text{ ft}^2$$

$$\frac{780}{50} = 15.6$$

Number of gallons = 16

7. Find the area of the shaded triangle.



$$\frac{1}{2} (9.5)(36)$$

$$171$$

Area = 171 ft²

8. A caterer has a 36 inch diameter table that is 8 inches tall. Suppose a table cloth exactly covers the top of the table. Find the area of the table cloth in square inches.

$$A = \pi (18)^2$$

$$A = 1017.9$$

Area = 1017.9 in²

9. A parallelogram has an area of 465 square decameters and a base of 15 decameters. Find the height of the parallelogram.

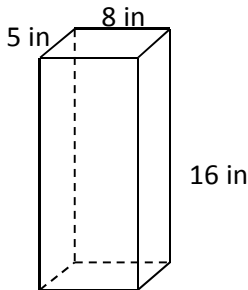
$$A = bh$$

$$465 = 15h$$

$$31 = h$$

Height = 31 dm

10. Find the surface area of the solid.



$$P = 5 + 8 + 5 + 8 = 26$$

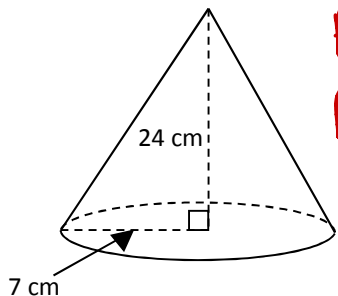
$$B = 5(8) = 40$$

$$A = 26(16) + 2(40)$$

$$A = 496$$

$$\text{Surface area} = \underline{496 \text{ in}^2}$$

11. Find the surface area and volume.



$$B = \pi(7)^2 = 49\pi$$

$$A = \frac{14\pi(25)}{2} + 49\pi$$

$$P = 2\pi(7) = 14\pi$$

$$A = 224\pi$$

$$7^2 + 24^2 = l^2$$

$$25 = l$$

$$V = \frac{49\pi(24)}{3}$$

$$V = 392\pi$$

$$\text{Surface area} = \underline{224\pi \text{ cm}^2}$$

 OR $\underline{703.7 \text{ cm}^2}$

$$\text{Volume} = \underline{392\pi \text{ cm}^3}$$

 OR $\underline{1231.5 \text{ cm}^3}$

12. Find the volume of the sphere whose surface area is 144π .

$$A = 4\pi r^2$$

$$V = \frac{4\pi(6)^3}{3}$$

$$144\pi = 4\pi r^2$$

$$144 = 4r^2$$

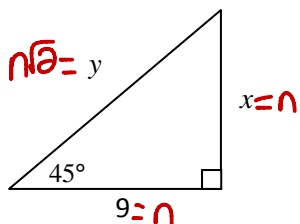
$$36 = r^2$$

$$6 = r$$

$$V = 288\pi$$

$$\text{Volume} = \underline{288\pi}$$

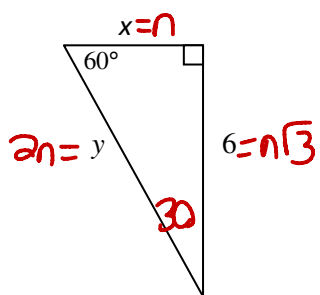
13. Find the value of x and y for the triangle.



$$x = \underline{9}$$

$$y = \underline{9\sqrt{2}}$$

14. Find the value of x and y for the triangle.



$$n\sqrt{3} = 6$$

$$\frac{6}{\sqrt{3}} = n$$

$$n = \frac{6 \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}} = \frac{6\sqrt{3}}{3} = 2\sqrt{3}$$

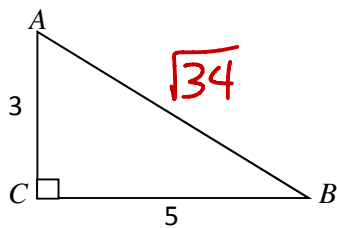
$$x = 2\sqrt{3}$$

$$x = \underline{2\sqrt{3}}$$

$$y = 2(2\sqrt{3}) = 4\sqrt{3}$$

$$y = \underline{4\sqrt{3}}$$

15. Find $\sin A$ and $\cos A$ as fractions.



$$3^2 + 5^2 = h^2$$

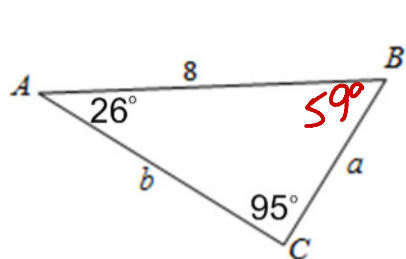
$$34 = h^2$$

$$\sqrt{34} = h$$

$$\sin A = \frac{5}{\sqrt{34}} = \frac{5\sqrt{34}}{34}$$

$$\cos A = \frac{3}{\sqrt{34}} = \frac{3\sqrt{34}}{34}$$

16. Find the three missing values for the right triangle. (Hint: Use Law of Sines)



$$\frac{\sin 95}{8} = \frac{\sin 26}{a}$$

$$\frac{\sin 95}{8} = \frac{\sin 59}{b}$$

$$a = 3.5$$

$$a \sin 95 = 8 \sin 26$$

$$b \sin 95 = 8 \sin 59$$

$$b = 6.9$$

$$a = \frac{8 \sin 26}{\sin 95}$$

$$b = \frac{8 \sin 59}{\sin 95}$$

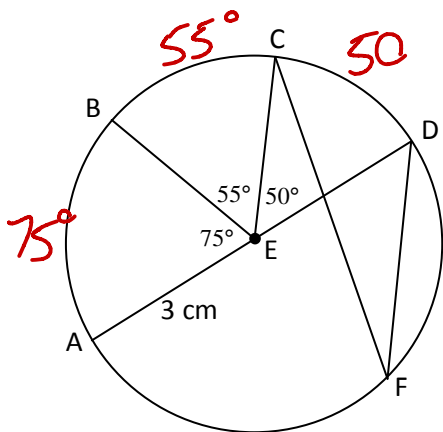
$$m\angle B = 59^\circ$$

$$a = 3.5$$

$$b = 6.9$$

$$B = 180 - 26 - 95 = 59^\circ$$

17. Find $m\widehat{BC}$, $m\widehat{AC}$, $m\angle BED$, $m\angle CFD$, the length of \widehat{CD} (cm).



$$m\widehat{BC} = 55^\circ$$

$$m\widehat{AC} = 130^\circ$$

$$\widehat{CD} = \frac{50}{360} \cdot 2\pi (3)$$

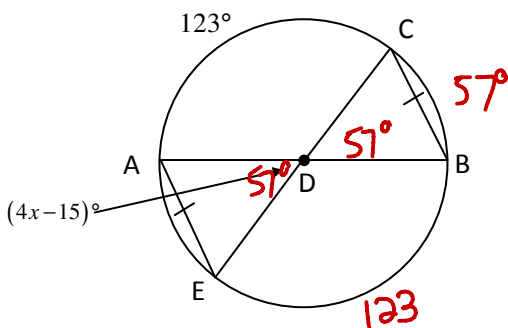
$$= 2.6$$

$$m\angle BED = 105^\circ$$

$$m\angle CFD = 25^\circ$$

$$\text{Length of } \widehat{CD} \text{ (cm)} = 2.6$$

18. Find the value of x .



$$360 - 123 - 123 = 114$$

$$\frac{114}{2} = 57$$

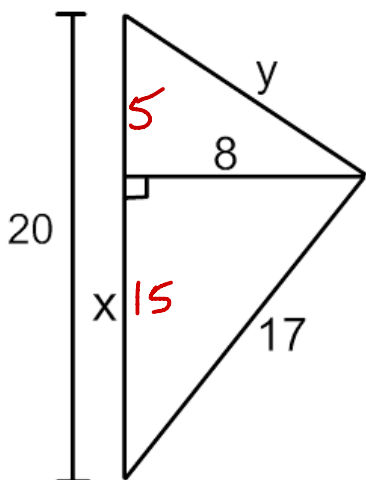
$$4x - 15 = 57$$

$$4x = 72$$

$$x = 18$$

$$x = 18$$

19. Solve for x and y. Round your answer to the nearest tenth if necessary.



$$8^2 + x^2 = 17^2$$

$$64 + x^2 = 289$$

$$x^2 = 225$$

$$x = 15$$

$$5^2 + 8^2 = y^2$$

$$29 = y^2$$

$$9.4 = y$$

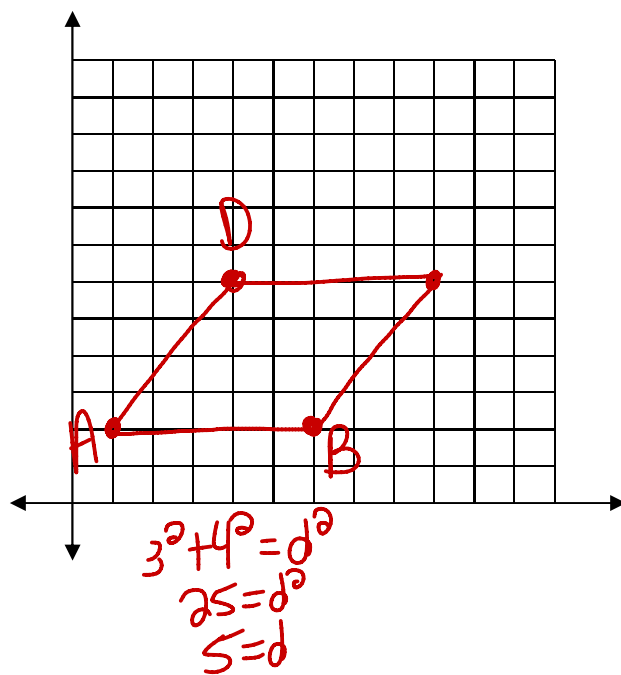
$$x = \underline{15}$$

$$y = \underline{9.4}$$

20. Plot and connect the four points on the graph. Circle the most specific quadrilateral name and explain why it is that shape using a complete sentence.

A(1,2) B(6,2) C(9,6) D(4,6)

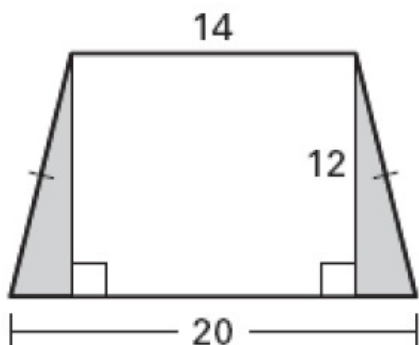
Circle One: Parallelogram Rectangle
 Square Trapezoid
Rhombus Isosceles Trapezoid



Explanation:

Both pairs of opposite sides
are parallel and all sides equal
5 so they are all congruent

21. Find the area of each of the following and use that to find the probability that a point chosen at random will land in the shaded region.



$$A_{\text{trap}} = \frac{1}{2}(14)(14+20)$$

$$= 204$$

$$A_{\text{rect}} = 14(12) = 168$$

$$A_{\text{shaded}} = 204 - 168$$

$$= 36$$

$$\text{Prob} = \frac{36}{204} = .176 \rightarrow 17.6\%$$

$$\text{Area Trapezoid} = \underline{204 \text{ u}^2}$$

$$\text{Area Rectangle} = \underline{168 \text{ u}^2}$$

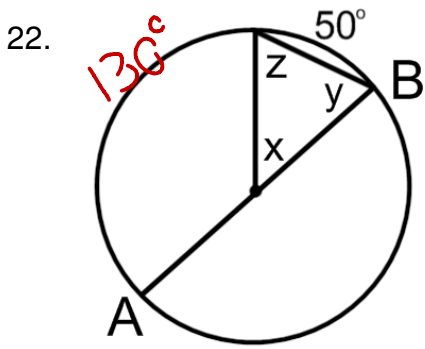
$$\text{Area Shaded} = \underline{36 \text{ u}^2}$$

$$\text{Probability} = \underline{17.6\%}$$

Remember the formulas for circles:

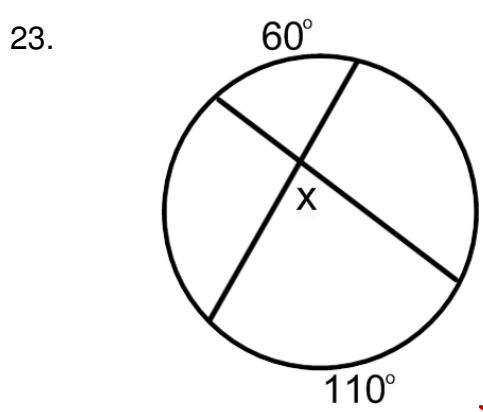
- Vertex at the center: Angle = intercepted arc
- Vertex on the circle: Angle = $\frac{1}{2}$ (intercepted arc)
- Vertex inside: Angle = $\frac{1}{2}$ (sum of intercepted arcs)
- Vertex outside: Angle = $\frac{1}{2}$ (difference of intercepted arcs)
- Segments: Product of parts = Product of parts

Solve for each of the following variables.

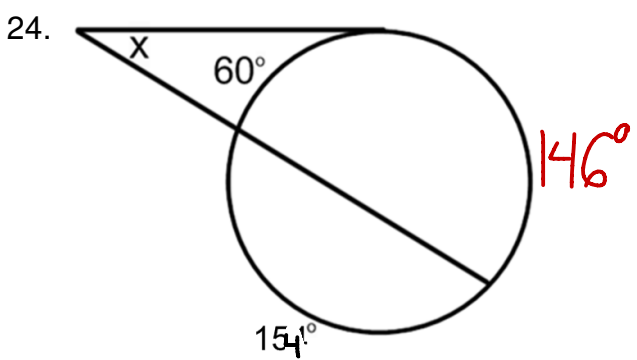


\overline{AB} is a diameter

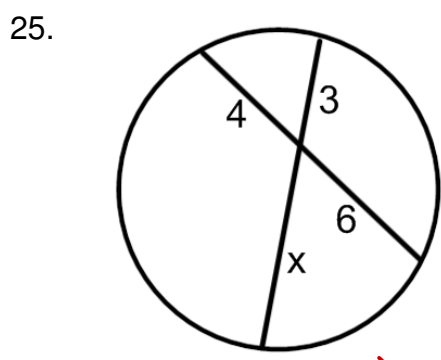
$y = \frac{1}{2}(130) = 65^\circ$
 $z = 180 - 50 - 65 = 65^\circ$
 $x = 50^\circ \quad y = 65^\circ \quad z = 65^\circ$



$x = \frac{1}{2}(60 + 110)$
 $x = 85$
 $x = 85^\circ$



$x = \frac{1}{2}(146 - 60)$
 $x = 43^\circ$
 $x = 43^\circ$



$3x = 6(4)$
 $3x = 24$
 $x = 8$
 $x = 8$