

# 2014/2015 Geometry Final Exam Review

1. In a large cube, the edges are 4 times as long as the edges of the small cube. The volume of the large cube is how many times the volume of the small cube?

$$SLR = \frac{1}{4}$$

$$VR = \frac{1}{64}$$

64 times larger

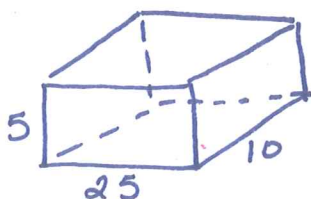
2. Two containers in the shape of right circular cylinders are equal in height. The radius of the larger container is 3 times the radius of the smaller container. The volume of the larger container is how many times the volume of the smaller container?

\* These are not similar \*

large:  $r = 3x, h = h$   
 small:  $r = x, h = h$  } plug in and see

9 times larger

3. In order to winterize her pool, Leah must remove one fourth of the water before putting the winter cover on. Her pool measures 5 feet deep, 10 feet wide and 25 feet long. If the pool is completely filled at the end of the summer (prior to winterizing), how much water, in cubic feet, would she need to remove?



$$V = Bh$$

$$= (25 \cdot 10) 5$$

$$V = 1250 \text{ ft}^3 \text{ total}$$

$\frac{1}{4}$  of total is removed

$$V = \frac{1}{4} (1250)$$

$V = 312.5 \text{ ft}^3 \text{ removed}$

4. In order to winterize her pool, Leah must remove half of the water before putting the winter cover on. Her pool measures 5 feet deep, 10 feet wide and 25 feet long. If the pool is completely filled at the end of the summer (prior to winterizing), how much water, in cubic feet, would she need to remove?

$$V = B \cdot h$$

$\frac{1}{2} V$  is removed

$$V_{\text{total}} = (25 \cdot 10) 5$$

$$V = \frac{1}{2} (1250)$$

$$V_{\text{total}} = 1250 \text{ ft}^3$$

$V = 625 \text{ ft}^3 \text{ removed}$

5. If a hot water tank, shown with the diameter of 5 feet and length of 13 feet, is filled with water, then the weight in pounds at room temperature, of the water inside the tank would be: (note: one cubic foot of water weighs approximately 62 lbs.)  $r = 2.5 \text{ ft}$

$$V = Bh$$

$$V = \pi r^2 \cdot h$$

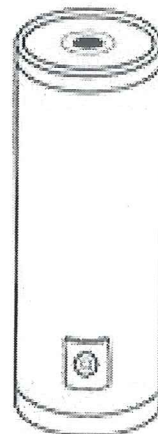
$$V = \pi (2.5)^2 (13)$$

$$V \approx 255.3 \text{ ft}^3$$

To find weight of  $H_2O$ :

$$(255.3)(62)$$

approx. = 15828.6 lbs



6. If a paint bucket, shown below with the diameter of 26 inches and length of 39 inches, is filled with paint, then the weight in pounds at room temperature, of the paint inside the take would be: (note: one cubic inch of paint weighs approximately 0.12 lbs.)  $r = 13 \text{ in}$   $h = 39 \text{ in}$

$$V = (\pi 13^2)(39)$$

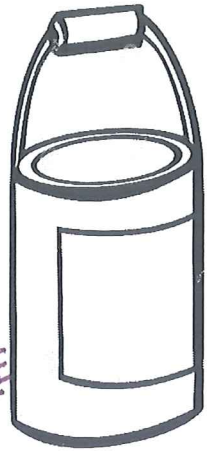
$$V \approx 20706.24$$

Weight:

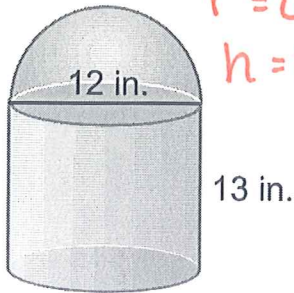
$$(20706.24)(.12)$$

$$\text{Weight} = 2484.75 \text{ lbs}$$

Wow!  
That's  
a HUGE  
bucket!



7. Find the volume of the composite solid. Round your answer to the nearest tenth.



$$r = 6 \text{ in}$$

$$h = 13 \text{ in}$$

$$V = B \cdot h + \frac{1}{2} \left( \frac{4}{3} \pi r^3 \right)$$

$$V = \pi r^2 h + \frac{1}{2} \left( \frac{4}{3} \pi r^3 \right)$$

$$V = \pi 6^2(13) + \frac{1}{2} \left( \frac{4}{3} \pi 6^3 \right)$$

$$V \approx 1922.7 \text{ in}^3$$

8. A box in the shape of a right rectangular prism has a volume of 60 cubic meters. The height of the box is 3 inches and the width is 4 inches. What is the length, in inches, of the box?

$$V = B \cdot h$$

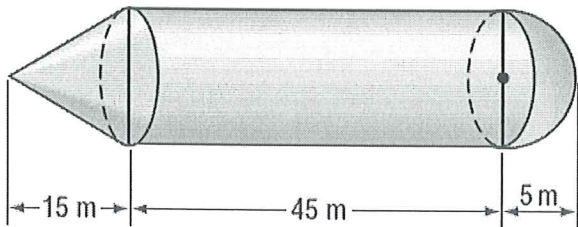
$$60 = 4l \cdot 3$$

$$60 = 12l$$

$$l = 5 \text{ in}$$

You must be able  
to do the algebra  
questions & work  
backwards!

9. College engineering students designed an enlarged external fuel tank of a space shuttle as part of an assignment. The professor liked the design so much, that she decided to have the fuel tank constructed and used. How many cubic meters can the fuel tank hold?



$$r = 5 \text{ m}$$

$$\text{height of cone: } h = 15 \text{ m}$$

$$\text{height of cylinder: } H = 45 \text{ m}$$

volume!

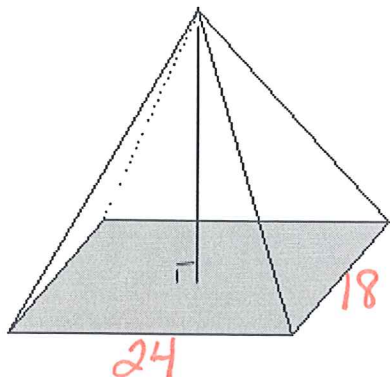
$$V = \text{cone} + \text{cylinder} + \frac{1}{2} \text{sphere}$$

$$V = \frac{1}{3} \pi r^2 h + \pi r^2 H + \frac{1}{2} \left( \frac{4}{3} \pi r^3 \right)$$

$$V = \frac{1}{3} \pi 5^2 \cdot 15 + \pi 5^2 \cdot 45 + \frac{1}{2} \left( \frac{4}{3} \pi 5^3 \right)$$

$$V \approx 4188.8 \text{ m}^3$$

10. The pyramid below has a rectangular base with side lengths of 24 inches and 18 inches it also has the volume of  $1728 \text{ in}^3$ . Find the height of the pyramid.



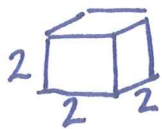
$$V = \frac{1}{3} B \cdot h$$

$$1728 = \frac{1}{3} (24 \cdot 18) (h)$$

$$1728 = 144h$$

$$h = 12 \text{ in.}$$

11. 12 ice cubes with 2 inch edges are stacked on a pan which is in the shape of a rectangular prism. It is 2 inches wide, 7 inches long and 1 inch deep. When the ice melts, will the ice's water overflow the pan?



$$V = (2 \cdot 2)(2)$$

$$V = 8 \text{ in}^3$$

\* 12 cubes

$$V = 96 \text{ in}^3$$



$$V = (7 \cdot 2)(1)$$

$$V = 14 \text{ in}^3$$

\* Looking for a reason! \*  
Yes, the volume of the water will overflow the pan b/c the volume is larger

12. If a sphere filled with liquid has a radius of 8 inches, will the volume exceed the volume of a cone with the same radius but with a height 20 inches? Show the math you used to solve this question.

$$r = 8 \text{ in}$$

$$V_s = \frac{4}{3} \pi 8^3$$

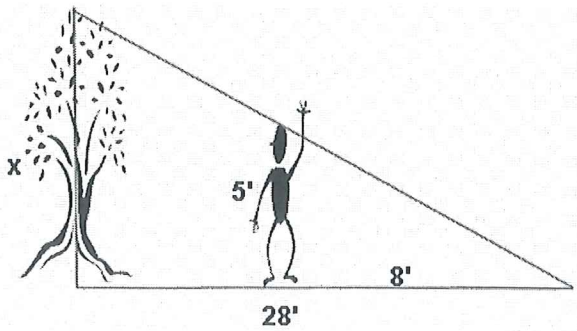
$$V_s = 2144.7 \text{ in}^3$$

$$V_c = \frac{1}{3} \pi 8^2 \cdot 20$$

$$V_c = 1340.4 \text{ in}^3$$

The volume of the sphere will exceed the volume of the cone by approx.  $804.3 \text{ in}^3$

13. Find x.

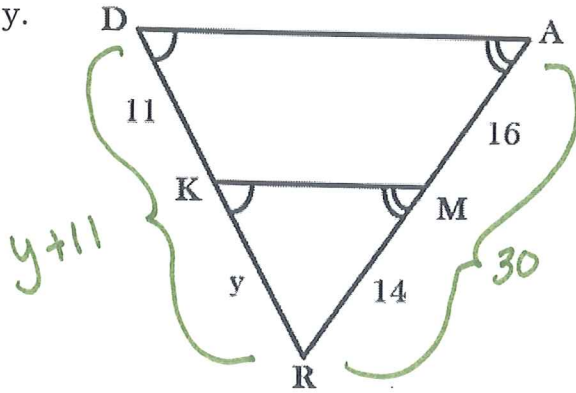


$$\frac{x}{5} = \frac{28}{8}$$

$$8x = 140$$

$$x = 17.5'$$

14. Find y.



$$\frac{y}{y+11} = \frac{14}{30}$$

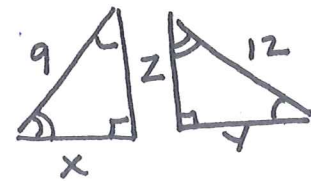
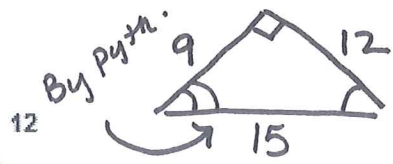
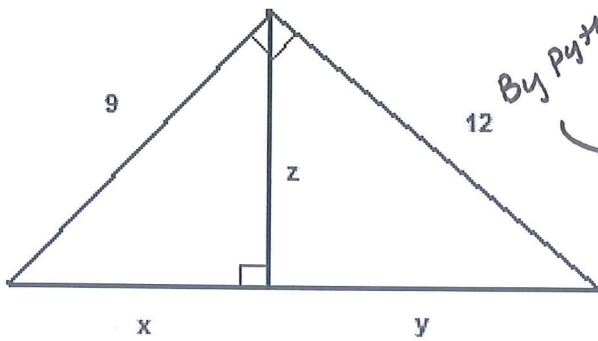
$$30y = 14(y+11)$$

$$30y = 14y + 154$$

$$16y = 154$$

$$y = 9.625$$

15. A right triangle is shown below. Find the lengths x, y, and z.



Find x

$$\frac{x}{9} = \frac{9}{15}$$

$$x = 5.4$$

Find y

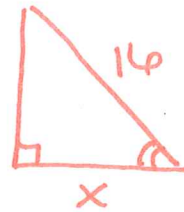
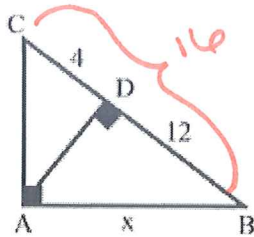
$$\frac{y}{12} = \frac{12}{15}$$

$$y = 9.6$$

$$\frac{z}{12} = \frac{9}{15}$$

$$z = 7.2$$

16. Find x.

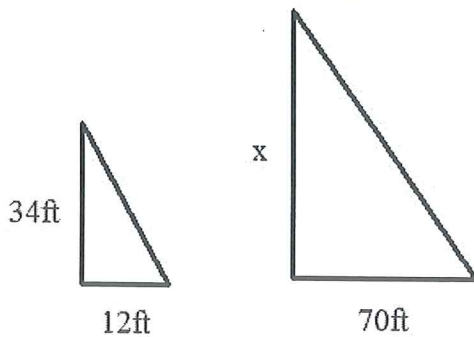


$$\frac{x}{12} = \frac{16}{x}$$

$$x^2 = 192$$

$$x = 8\sqrt{3}$$

17. Find x. — Assume the two triangles are similar.

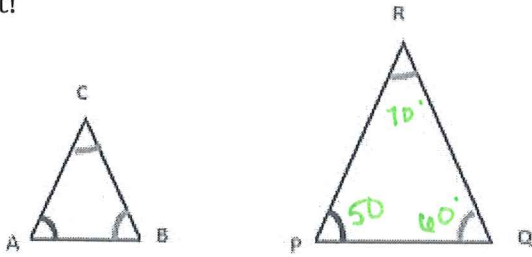


$$\frac{x}{34} = \frac{70}{12}$$

$$12x = 2380$$

$$x = 198.3 \text{ ft}$$

18.  $\triangle ABC \sim \triangle PQR$ . If  $\angle P = 50^\circ$ ,  $\angle Q = 60^\circ$ ,  $\angle R = 70^\circ$ , find  $x$  if  $\angle B = 4x^\circ$ . Mark the picture first!



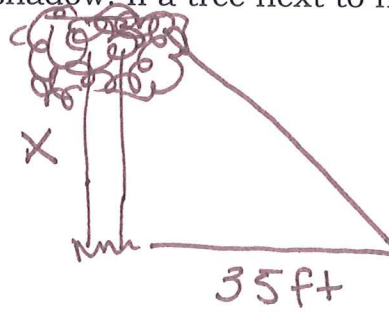
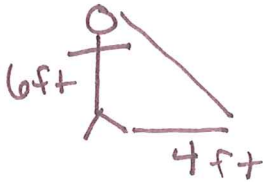
Corresponding  $\angle$ s are  $\cong$  in Similar  $\Delta$ s.

$$\angle B \cong \angle Q$$

$$4x = 60$$

$$x = 15$$

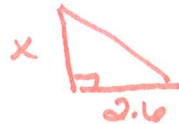
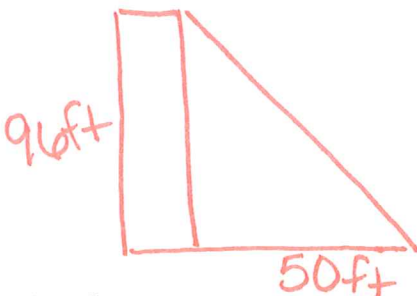
19. A 6-foot tall teacher casts a 4-foot shadow. If a tree next to him casts a 35 ft shadow, how tall is the tree?



$$\frac{x}{6} = \frac{35}{4}$$

$$x = 52.5 \text{ ft}$$

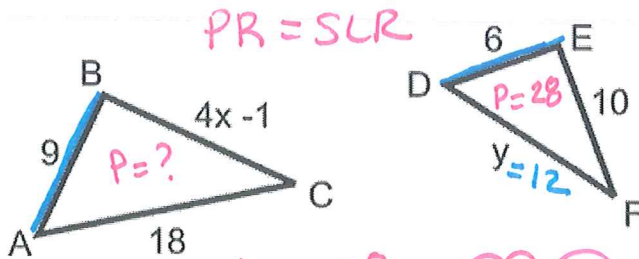
20. A 96-ft building casts a 50-ft shadow. If a tourist next to the building is casting a 2.6-ft shadow, how tall is the tourist? Round to the nearest whole number.



$$\frac{x}{96} = \frac{2.6}{50}$$

$$x = 5.0 \text{ ft}$$

21. If  $\triangle ABC \sim \triangle DEF$ , find the perimeter of  $\triangle ABC$ .



$$PR = SLR$$

$$\frac{6}{9} = \frac{y}{18}$$

$$y = 12$$

$$\frac{6}{9} = \frac{10}{4x-1}$$

$$6(4x-1) = 9 \cdot 10$$

$$24x - 6 = 90$$

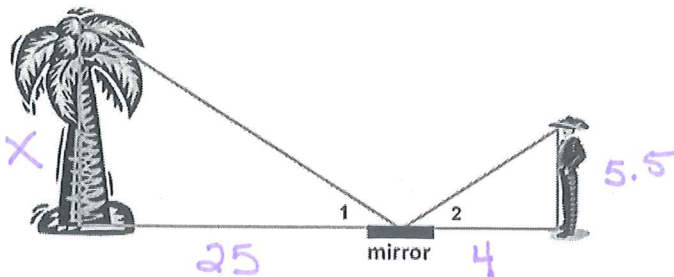
$$24x = 96$$

$$x = 4$$

$$\frac{6}{9} = \frac{28}{P}$$

$$P = 42$$

22. Antonio stands so that he can see the top of a palm tree in a mirror placed on the ground between them. The mirror is 4ft from his feet and 25 ft from the base of the tree. Antonio's eyes are 5.5 ft off the ground. How high is the palm tree? Round to the nearest tenth.



$$\frac{x}{5.5} = \frac{25}{4}$$

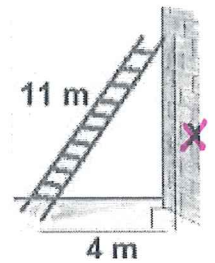
$$x = 34.4 \text{ ft}$$

23. A ladder 11m long is leaning against a building. The base of the ladder is 4m from the base of the building. How high up the wall does the ladder reach?

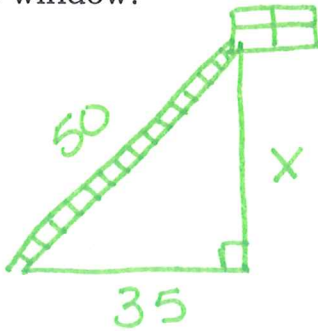
$$4^2 + x^2 = 11^2$$

$$\sqrt{105} = x$$

$$x = \sqrt{105} \text{ m}$$



24. A 50ft ladder reaches up to a 3<sup>rd</sup> story window in order to rescue a little girl from a burning building. The base of the ladder is 35ft from the base of the building. How high is the window?



$$x^2 + 35^2 = 50^2$$

$$x^2 = 1275$$

$$x = 5\sqrt{51} \text{ ft}$$

25. State whether the following sets of measures represent the sides of a right triangle.

a) 20, 48, 52 **yes!**

b) 9, 40, 41 **yes!**

c) 21, 21, 31 **no**

d) 12, 34, 37 **no**

check using  
the Pythagorean  
Thm!

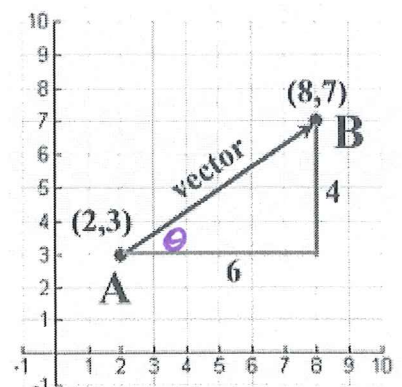
26. Write the component form of the vector and find the magnitude and direction of the vector.

Component:  $\langle 6, 4 \rangle$

magnitude:  $6^2 + 4^2 = \sqrt{52}$   
 $= 2\sqrt{13}$

direction:  $\tan \theta = \frac{4}{6}$

$\theta = 33.7^\circ$

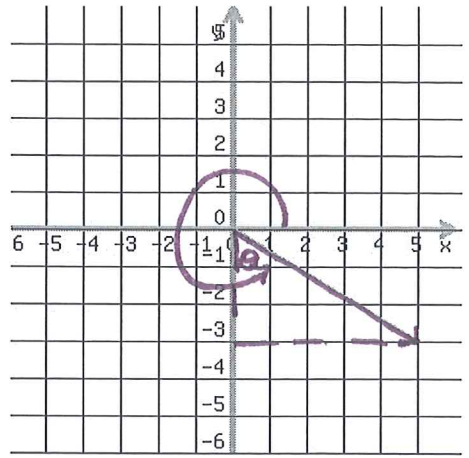


27. Write the component form of the vector and find the magnitude and direction of the vector.

Component:  $\langle 5, -3 \rangle$

magnitude:  $3^2 + 5^2 = \sqrt{34}$

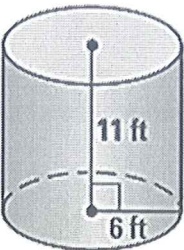
direction:  $\theta + 270$   
 $\tan \theta = \frac{5}{3}$   
 $\theta = 59.0$   $\rightarrow 329.0^\circ$

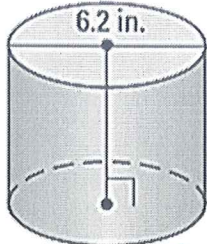


28. Find the component form of vector MN with M(1, 2) and N(4, 6).

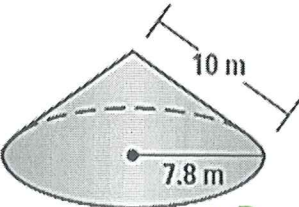
$\langle 4-1, 6-2 \rangle = \langle 3, 4 \rangle$

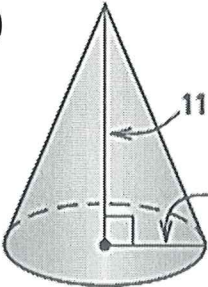
29. Find the surface area of the right cylinder. Keep your answers in terms of pi.

a)   $SA = 2\pi 6^2 + 2\pi 6 \cdot 11$   
 $SA = 204\pi \text{ ft}^2$

b)   $r = 3.1 \text{ in}$   
 $SA = 2\pi (3.1)^2 + 2\pi (3.1)(10)$   
 $SA = 81.22\pi \text{ in}^2$

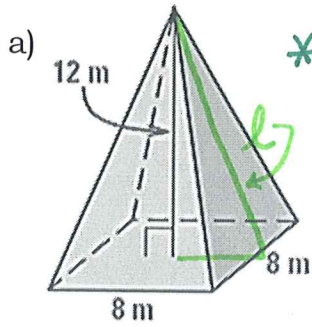
30. Find the surface area of the cones below. Round to the nearest tenth.

a)   $SA = \pi (7.8)^2 + \pi (7.8)(10)$   
 $SA \approx 436.2 \text{ m}^2$

b)   $11 \text{ in.}$   
 $4.5 \text{ in.}$   
 \* First find slant height by pythag. thm  
 $l = 11.9$   
 $SA = \pi (4.5)^2 + \pi (4.5)(11.9)$   
 $SA = 231.8 \text{ in}^2$

SA means add up all areas of the faces of pyramid

31. Find the surface area of the square pyramid. Round your answer to the nearest tenth.

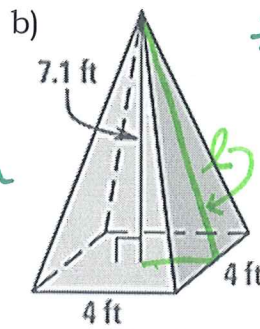


\* first find  $l$   
by pythag. thm  
 $l = \sqrt{160} \approx 12.6 \text{ m}$

$$\begin{aligned} \text{SA} &= (8)(8) \\ &+ 4\left(\frac{1}{2}(8)(12.6)\right) \end{aligned}$$


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$$\boxed{\text{SA} = 265.6 \text{ m}^2}$$



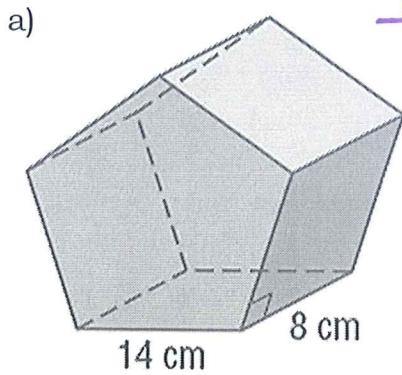
\* find slant height  
first by pytho  
thm.  
 $l = 7.4 \text{ ft}$

$$\begin{aligned} \text{SA} &= (4)(4) \\ &+ 4\left(\frac{1}{2}(4)(7.4)\right) \end{aligned}$$

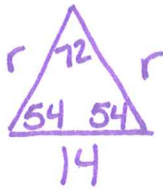

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$$\boxed{\text{SA} = 75.2 \text{ ft}^2}$$

32. Find the surface area of the figures below. The bases are regular polygons. Round to the nearest whole number.



Area of Base



$$\frac{\sin 72}{14} = \frac{\sin 54}{r}$$

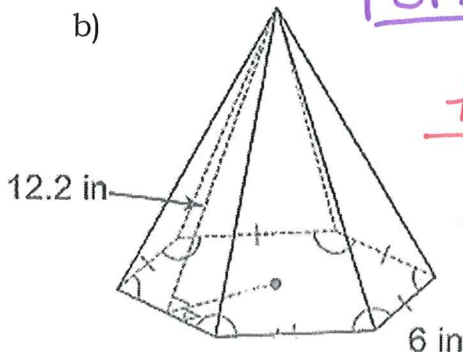
$$r = \frac{14 \sin 54}{\sin 72}$$

$$r = 11.9 \text{ cm}$$

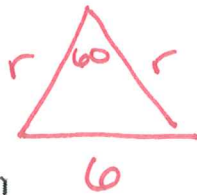
$$B = 5 \frac{1}{2} (11.9)^2 \sin 72$$

$$\begin{aligned} \text{SA} &= 2 \left( 5 \frac{1}{2} (11.9)^2 \sin 72 \right) \\ &+ 5(8 \cdot 14) \end{aligned}$$

$$\boxed{\text{SA} \approx 1233.4 \text{ cm}^2} \Rightarrow 1233 \text{ cm}^2$$



Area of Base



$$r = 6$$

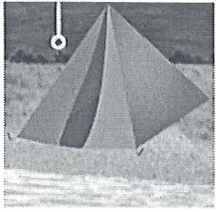
$$B = 6 \frac{1}{2} 6^2 \sin 60$$

$$\begin{aligned} \text{SA} &= 6 \frac{1}{2} 6^2 \sin 60 \\ &+ 6\left(\frac{1}{2} \cdot 6 \cdot 12.2\right) \end{aligned}$$

$$\boxed{\text{SA} \approx 313.1 \text{ in}^2} \Rightarrow 313 \text{ in}^2$$

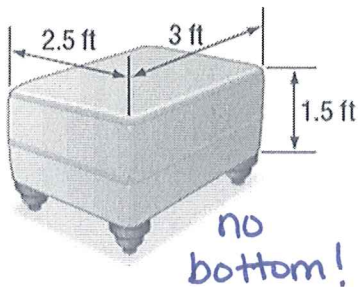


33. A camping tent made of nylon is seen below in the shape of a square pyramid. If the triangular panels are 10 feet wide and 7 feet tall, how much material will it take to make the tent, including the base?



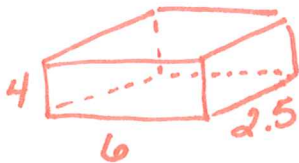
$$\begin{array}{r}
 4 \left( \frac{1}{2} 10 \cdot 7 \right) \\
 + 10 \cdot 10 \\
 \hline
 240 \text{ ft}^2 \text{ of material is} \\
 \text{needed to make the tent}
 \end{array}$$

34. Jill wants to have her ottoman, shown below, reupholstered. Find the surface area that will be reupholstered.



$$\begin{array}{r}
 \text{SA: } 2.5 \cdot 3 \\
 2 (1.5 \cdot 3) \\
 + 2 (1.5 \cdot 2.5) \\
 \hline
 24 \text{ ft}^2 \text{ to be reupholstered}
 \end{array}$$

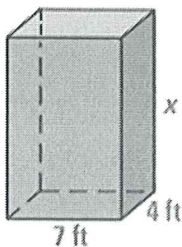
35. A library has an aquarium in the shape of a rectangular prism. The base is 6 feet by 2.5 feet, and the height is 4 feet. How many square feet of glass was used to build the aquarium? *→ in order to put fish in, no glass can be on the top*



$$\begin{array}{r}
 2(4 \cdot 6) \\
 2(4 \cdot 2.5) \\
 + 6 \cdot 2.5 \\
 \hline
 83 \text{ ft}^2 \text{ of glass} \\
 \text{to make aquarium}
 \end{array}$$

36. Solve for the variable given the surface area  $S$  of the right prism. Round to the nearest tenth.

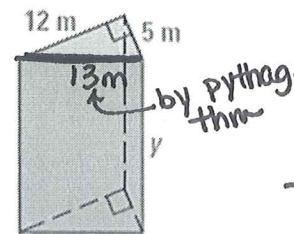
a)  $S = 298 \text{ ft}^2$



$$\begin{array}{r}
 2(7 \cdot x) = 14x \\
 2(4 \cdot x) = 8x \\
 + 2(7 \cdot 4) = 56 \\
 \hline
 S = 298 \text{ ft}^2
 \end{array}$$

$$\begin{array}{r}
 22x + 56 = 298 \\
 22x = 242 \\
 \boxed{x = 11 \text{ ft}}
 \end{array}$$

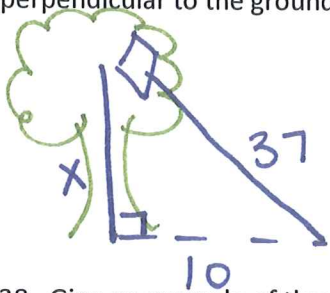
b)  $S = 870 \text{ m}^2$



$$\begin{array}{r}
 2 \left( \frac{1}{2} \cdot 12 \cdot 5 \right) \\
 13y \\
 5y \\
 + 12y \\
 \hline
 S = 870
 \end{array}$$

$$\begin{array}{r}
 30y + 60 = 870 \\
 30y = 810 \\
 \boxed{y = 27 \text{ m}}
 \end{array}$$

37. Timmy is flying a kite. The length of the string is 37 feet. The kite gets caught on the top of a tree that is perpendicular to the ground. Timmy is 10 feet from the tree's base. How tall is the tree?



$$x^2 + 10^2 = 37^2$$

$$x^2 = 1269$$

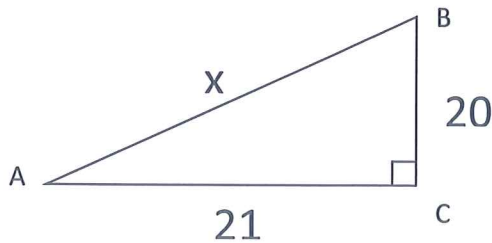
$$x = 3\sqrt{141} \text{ ft}$$

38. Give an example of three measures that could represent the sides of a right triangle. Prove or explain why these measures work.

3, 4, 5 because  $3^2 + 4^2 = 5^2$



39. Consider the triangle ABC, shown below. Use the Pythagorean Theorem to find the missing side. Then find all trig ratios below and simplify all answers.



soh cah toa

$x = 29$  Pythag. Thm

$\sin \angle A = \frac{20}{29}$

$\cos \angle A = \frac{21}{29}$

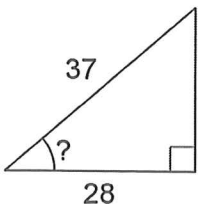
$\tan \angle A = \frac{20}{21}$

$\sin \angle B = \frac{21}{29}$

$\cos \angle B = \frac{20}{29}$

$\tan \angle B = \frac{21}{20}$

40. Find the measure of the missing angle.

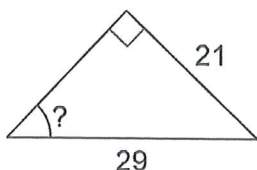


$$\cos \theta = \frac{28}{37}$$

$$\theta = \cos^{-1}\left(\frac{28}{37}\right)$$

$$\theta \approx 40.8^\circ$$

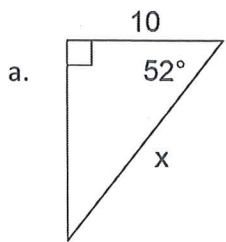
41. Find the measure of the missing angle.



$$\theta = \sin^{-1}\left(\frac{21}{29}\right)$$

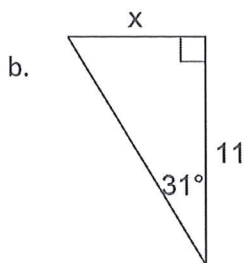
$$\theta \approx 46.4^\circ$$

42. Solve to find each missing side. Round to the nearest tenth.



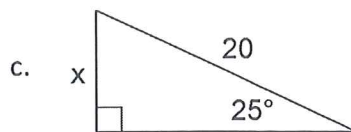
$$\cos 52 = \frac{10}{x}$$

$$x \approx 16.2$$



$$\tan 31 = \frac{x}{11}$$

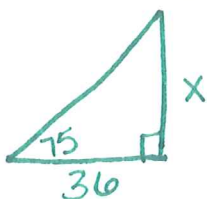
$$x \approx 6.6$$



$$\sin 25 = \frac{x}{20}$$

$$x \approx 8.5$$

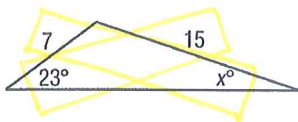
43. Hannah is looking up at the top of a building at a  $75^\circ$  with the ground. She is standing 36 feet from the building. How tall is the building? Round answer to the nearest tenth.



$$\tan 75 = \frac{x}{36}$$

$$x = 134.4 \text{ ft tall}$$

44. Find  $x$  to the nearest degree.



Law of Sines

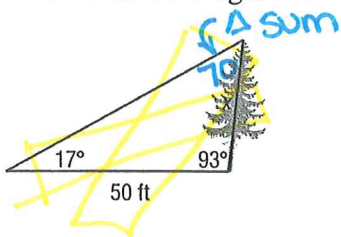
$$\frac{\sin 23}{15} = \frac{\sin x}{7}$$

$$\sin x = \frac{7 \sin 23}{15}$$

$$x = \sin^{-1}\left(\frac{7 \sin 23}{15}\right)$$

$$x = 10.5^\circ$$

45. A tree grew at a  $3^\circ$  slant from the vertical. At a point 50 feet from the tree, the angle of elevation to the top of the tree is  $17^\circ$ . Find the length of the tree to the nearest tenth of a foot.

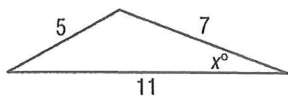


$$\frac{\sin 17}{x} = \frac{\sin 70}{50}$$

$$50 \sin 17 = x \sin 70$$

$$x = 15.6 \text{ ft}$$

46. Find  $x$  to the nearest degree.



Law of Cosine

$$5^2 = 7^2 + 11^2 - 2(7)(11) \cos x$$

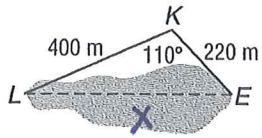
$$25 = 170 - 154 \cos x \quad \leftarrow \text{NOT like terms!}$$

$$-145 = -154 \cos x$$

$$x = \cos^{-1}\left(\frac{-145}{-154}\right)$$

$$x \approx 19.7 \Rightarrow x \approx 20^\circ$$

47. To approximate the length of a pond, a surveyor walks 400 meters from point  $L$  to point  $K$ , then turns and walks 220 meters from point  $K$  to point  $E$ . If  $m\angle LKE = 110$ , find the length  $LE$  of the pond to the nearest tenth of a meter.



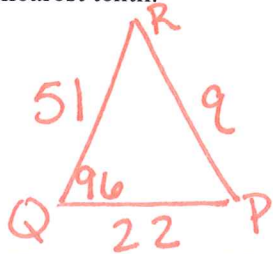
$$x^2 = 400^2 + 220^2 - 2(220 \cdot 400) \cos 110$$

$$x = \sqrt{\text{all of the above } \cup}$$

$$x = 518.3 \text{ m}$$

Find all things missing!

48. Solve  $\triangle PQR$  for  $r = 22$ ,  $p = 51$ , and  $m\angle Q = 96$ . Round angle measures to the nearest degree and side measures to the nearest tenth.



$$q^2 = 51^2 + 22^2 - 2(51)(22) \cos 96$$

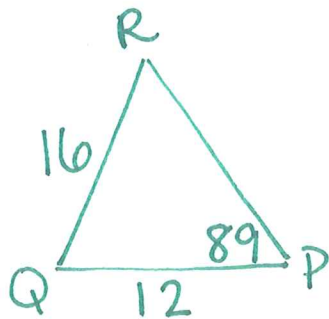
$$q = 57.6$$

$$\frac{\sin P}{51} = \frac{\sin 96}{57.6} \rightarrow \angle P = 55.8^\circ \rightarrow \boxed{56^\circ}$$

By  $\Delta$  sum:

$$\angle R = 28^\circ$$

49. Solve Triangle PQR, given that:  $m\angle P = 89^\circ$ ,  $p = 16$ ,  $r = 12$ .



\* Find  $\angle R$  1st!

$$\frac{\sin R}{12} = \frac{\sin 89}{16}$$

$$\angle R = 49^\circ$$

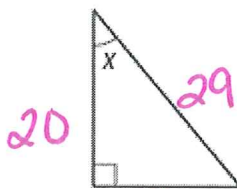
By  $\Delta$  sum:

$$\angle Q = 42^\circ$$

$$\frac{\sin 42}{q} = \frac{\sin 89}{16}$$

$$q = 10.7$$

50. In the figure, if  $\cos x = \frac{a}{h} = \frac{20}{29}$ , what are  $\sin x$  and  $\tan x$ ?



21 ← find by Pytha. Thm

A  $\sin x = \frac{29}{21}$  and  $\tan x = \frac{29}{21}$

B  $\sin x = \frac{21}{29}$  and  $\tan x = \frac{20}{21}$

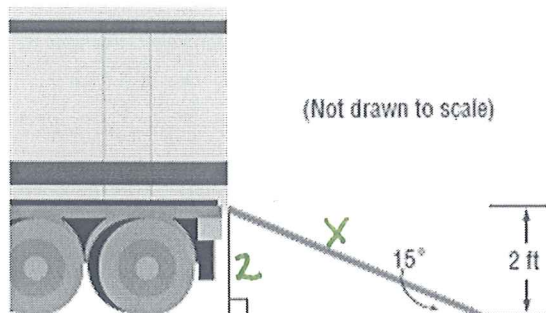
C  $\sin x = \frac{29}{21}$  and  $\tan x = \frac{21}{20}$

D  $\sin x = \frac{21}{29}$  and  $\tan x = \frac{21}{20}$

$$\sin x = \frac{21}{29}$$

$$\tan x = \frac{21}{20}$$

51. **TRUCKS** The tailgate of a moving truck is 2 feet above the ground. The incline of the ramp used for loading the truck is  $15^\circ$  as shown. Find the length of the ramp to the nearest tenth of a foot.

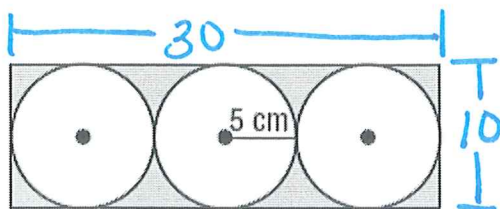


Kelly and Jackie are debating the correct length of the ramp that the movers need in order to move their stuff to their new place. Who is reasoning correctly? Explain who is showing the correct work in complete sentences, support your answer with mathematical vocabulary.

Jackie's Work	Kelly's Work
$\sin 15^\circ = \frac{2}{x}$ $x \sin 15^\circ = 2$ $x = \frac{2}{\sin 15^\circ}$ $x = 7.2 \text{ ft}$	$\tan 15^\circ = \frac{2}{x}$ $x \tan 15^\circ = 2$ $x = \frac{2}{\tan 15^\circ}$ $x = 7.5 \text{ ft}$

Jackie is correct because the height is 2 as the opposite side and  $x$  is the hypotenuse

52. A gardener installs 3 sprinklers in a rectangular plot. Each sprinkler waters a circular region with a radius of 5 cm, as shown below. No portion of the plot is watered by more than 1 sprinkler. What is the approximate area of the portion of the plot that is NOT watered by a sprinkler? Round to the nearest tenth.

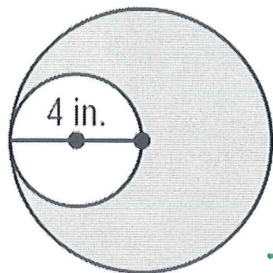


$$A = (30)(10) - 3\pi 5^2$$

$$A = 300 - 75\pi$$

$$A = 64.4 \text{ cm}^2$$

53. The figure below shows two tangent circles where the 4-inch diameter of the smaller circle is equal to the radius of the larger circle. What percent of the larger circle is shaded?



$$A = \text{Big} - \text{Little}$$

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

$$A = 12\pi \text{ in}^2 \leftarrow \text{shaded region}$$

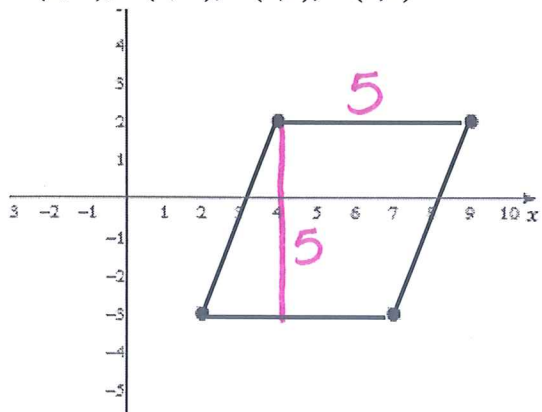
$$\text{Total Area: } 16\pi \text{ in}^2$$

% shaded:

$$\frac{12\pi}{16\pi} = 75\%$$

54. Given the coordinates of the vertices below, find the area of the parallelogram.

A(2,-3), B(7,-3), C(9,2), D(4,2)

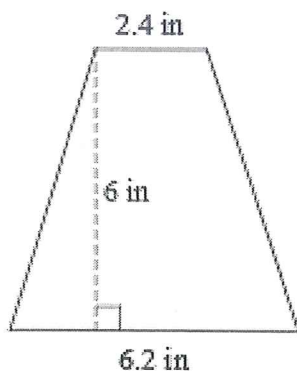


$$A = b \cdot h$$

$$A = 5 \cdot 5$$

$$A = 25 \text{ units}^2$$

55. Find the area of the trapezoid.

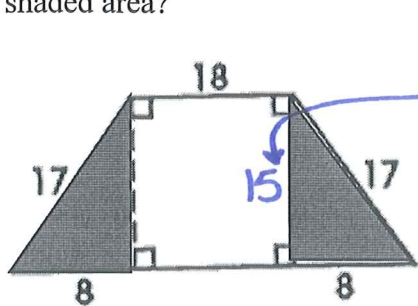


$$A = \frac{1}{2}(b_1 + b_2)h$$

$$A = \frac{1}{2}(6.2 + 2.4)(6)$$

$$A = 25.8 \text{ in}^2$$

56. The trapezoid below is divided into 2 triangles and 1 rectangle. Lengths are given in inches. What is the shaded area?



$$8^2 + h^2 = 17^2$$

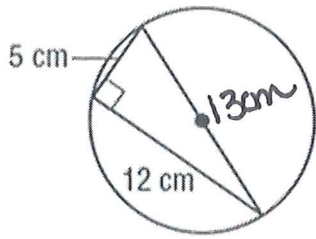
$$h = 15$$

shaded:

$$2\left(\frac{1}{2} \cdot 15 \cdot 8\right)$$

$$= 120 \text{ in}^2$$

57. What is the area of the circle?



$$r = 6.5 \text{ cm}$$

$$A = \pi 6.5^2$$

$$A = 42.25\pi \text{ cm}^2$$

$$A = 132.7 \text{ cm}^2$$

58. Find the area of a circle if the circumference is  $20\pi$ .

$$C = 20\pi$$

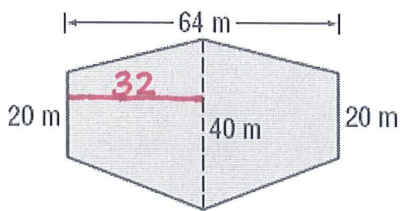
$$20\pi = 2\pi r$$

$$10 = r$$

$$A = \pi 10^2$$

$$A = 100\pi \text{ units}^2$$

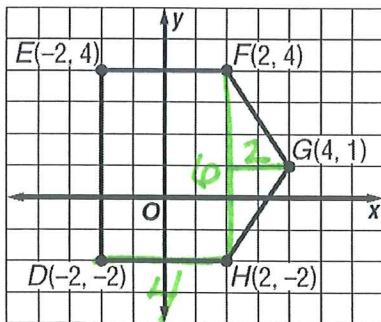
59. Roy is fencing his tomato garden to protect it from rabbits and deer. If the diagram provided below is his tomato garden, what is the area of the garden to be fenced, in square meters?



$$A = 2 \left( \frac{1}{2} (20 + 40) 32 \right)$$

$$A = 1920 \text{ m}^2$$

60. Find the area of the following figure.

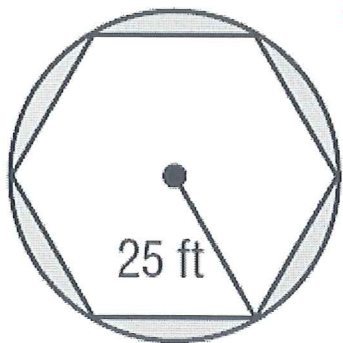


$$4 \cdot 6 \leftarrow \text{rectangle}$$

$$+ \frac{1}{2} \cdot 6 \cdot 2 \leftarrow \text{triangle}$$

$$A = 30 \text{ units}^2$$

61. Find the area of the circle and the area of the shaded region.



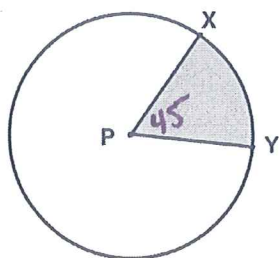
$$\begin{aligned} \text{shaded: } & \text{O} - \text{hexagon} \\ & = \pi 25^2 - 6 \cdot \frac{1}{2} \cdot 25 \cdot 25 \sin 60 \\ & = 339.7 \end{aligned}$$

$$\begin{aligned} \text{total: } & \text{O} \\ & = \pi 25^2 \\ & = 625\pi \\ & = 1963.5 \text{ ft}^2 \end{aligned}$$

area of the circle: 1963.5 ft<sup>2</sup>

area of the shaded region: 339.7 ft<sup>2</sup>

62. The length of arc  $XY$  of the following circle is equal to  $\frac{1}{8}$  of the circumference of Circle P. The arc length is  $3\pi$  meters. Find the radius, the central angle, and the area of the shaded sector. Round to the nearest tenth.



$$\text{arc length} = \frac{a}{360} \cdot \overset{C}{d}\pi$$

$$3\pi = \frac{1}{8} d\pi$$

$$d = 24 \text{ m}$$

$$\text{Sector: } \frac{45}{360} \cdot \pi 12^2 \left[ \frac{\text{angle}}{360} \cdot \text{area of circle} \right]$$

$$= 18\pi \text{ m}^2 \text{ or } 56.5 \text{ m}^2$$

Radius = 12 m

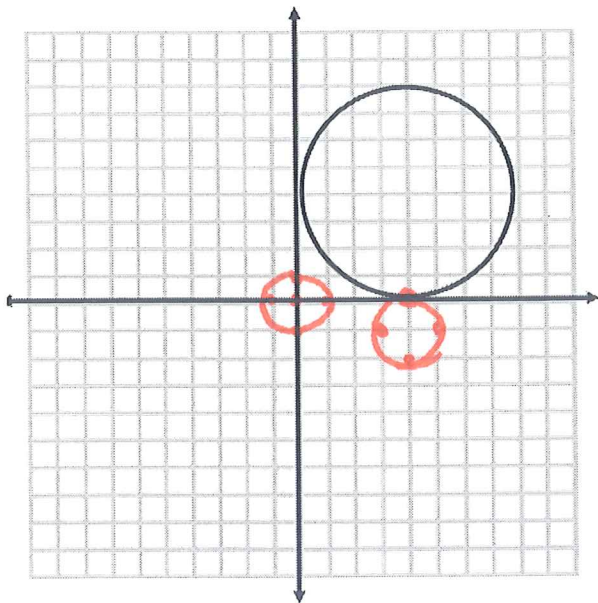
$\frac{1}{8} \cdot 360$  Central Angle = 45°

Sector Area = 56.5 m<sup>2</sup>



63. The circle below is graphed from the equation  $(x - 4)^2 + (y - 4)^2 = 16$ .  $(4, 4)$   $r = 4$

- a. Graph and write an equation of another circle which is tangent to the one given.
- b. Graph and write an equation of a third circle which is NOT tangent to the circle given, nor the circle from part a, and has a center at the origin.



so many options!!!

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

b)  $x^2 + y^2 = 1$

Find the length of each arc. Round your answer to the nearest tenth.

64. Radius = 13 mi and the central angle is  $45^\circ$

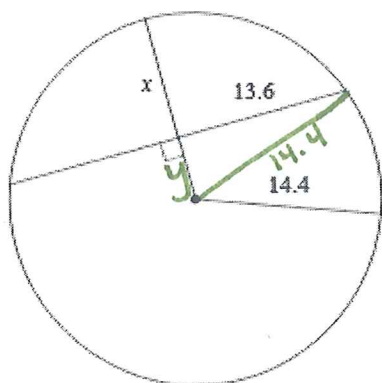
Arc Length:  $\frac{a}{360} \cdot C$

$$\frac{45}{360} \cdot 26\pi = \boxed{3.25\pi \text{ mi}} \\ \text{OR} \\ \boxed{10.2 \text{ mi}}$$

65. If the ratio of the circumference of two circles is 4:7, what is the ratio of their radii?

4:7

66. Find the length of the segment indicated. Round your answer to the nearest tenth if necessary.



$$13.6^2 + y^2 = 14.4^2$$

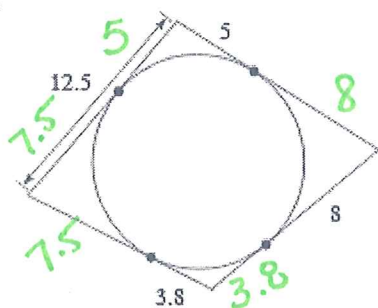
$$y^2 = 22.4$$

$$y = 4.7$$

$$x = 14.4 - 4.7$$

$$x = 9.7 \text{ units}$$

67. Find the perimeter of the polygon. Assume lines which appear to be tangent are tangent.



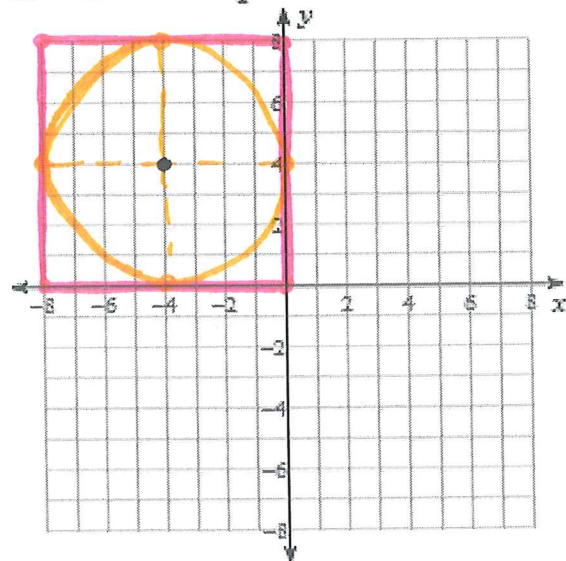
$$P = 48.6 \text{ units}$$

68. Use the information below to answer the questions which follow.

The points of a square are  $(0,0)$ ,  $(-8,0)$ ,  $(-8,8)$ , and  $(0,-8)$ .

1. Graph the square.

2. Write the equation of a circle that would be inscribed inside this square.



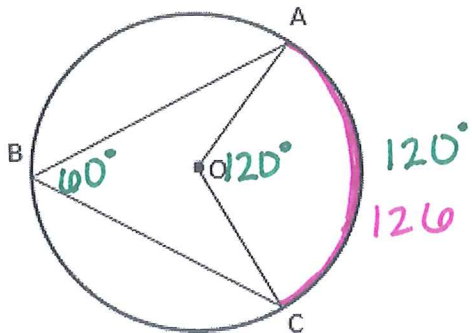
$$\text{Center: } (-4, 4)$$

$$r = 4$$

$$(x+4)^2 + (y-4)^2 = 16$$

69. If  $AB = BC$ , and  $\angle ABC = 60^\circ$ :

- What is the measure of  $\angle AOC$ ?  $120^\circ$
- If  $\text{arc } \widehat{AC} = 126^\circ$ , what is the measure of  $\widehat{AB}$ ?



$$360 - 126 = 234^\circ$$

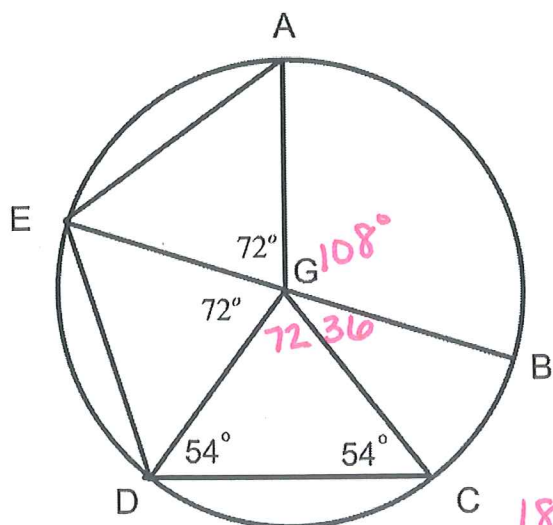
↑  
cut into 2  $\cong$  parts

$m \widehat{AB} = 117^\circ$

70. Given: EB is a diameter of circle G.

True or False? If false, correct the statement to make it true.

- $\angle BGC = 72^\circ \rightarrow \angle BGC = 36^\circ$
- $AE \parallel CD \rightarrow AE \cong CD$
- $\angle GED = \angle GDC$  True!
- $\angle DGC = 54^\circ \rightarrow \angle DGC = 72^\circ$
- $\overline{ED} \cong \overline{AG}$
- $\overline{AE} \cong \overline{CD} \rightarrow EG \cong AG$   
True!



$$180 - 72 = 108$$

$$360 - 108 - 72 - 72 - 72 = 36$$

$$180 - 54 - 54 = 72$$