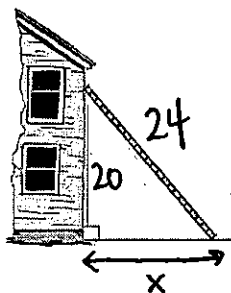


Directions: Show all work. Use the reference sheet for all formulas. (www.burmeister.weebly.com)

1. A 24-foot ladder is leaning against a building. If the ladder reaches the building at 20 feet above the ground, how far away from the building is the bottom of the ladder? Round your answer to the nearest tenth.



$$x^2 + 20^2 = 24^2$$

$$x^2 + 400 = 576$$

$$\begin{array}{r} -400 \quad -400 \\ \hline \sqrt{x^2} = \sqrt{176} \\ x = 13.266... \end{array}$$

$$\boxed{13.3 \text{ ft}}$$

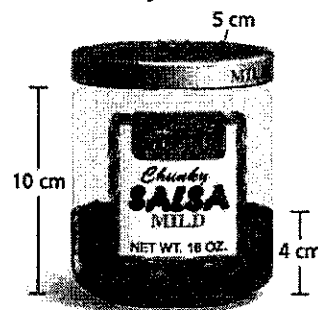
2. Ryan buys a jar of salsa for his party. The amount of salsa left after the party is shown below. Determine the amount of salsa that was eaten. Write your answer in terms of  $\pi$ .

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

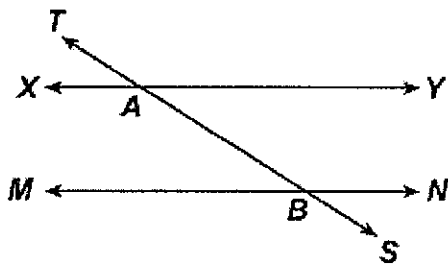
$$V = \pi \cdot 5^2 \cdot 6$$

$$V = \pi \cdot 25 \cdot 6$$

$$V = \boxed{150\pi \text{ cm}^3}$$



3. In the diagram below, parallel lines are cut by a transversal.



Complete each statement using the diagram.

Vertical Angles:  $\angle TAX$  and  $\angle \underline{BAY}$

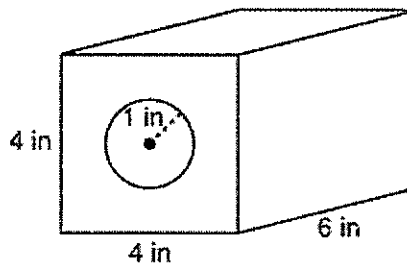
Corresponding Angles:  $\angle TAX$  and  $\angle \underline{ABM}$

Supplementary Angles:  $\angle TAX$  and  $\angle \underline{TAY}$

Alternate Interior Angles:  $\angle BAY$  and  $\angle \underline{ABM}$

Alternate Exterior Angles:  $\angle TAX$  and  $\angle \underline{SBN}$

4. A solid metal prism has a rectangular base with sides of 4 inches and 6 inches, and a height of 4 inches. A hole in the shape of cylinder, with a radius of 1 inch, is drilled through the entire length of the rectangular prism.



Determine the volume of the remaining solid to the nearest tenth.

$$V = l \cdot w \cdot h \quad V = \pi r^2 h$$

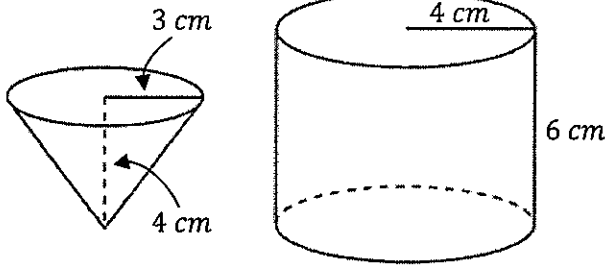
$$V = 4 \cdot 4 \cdot 6 \quad V = \pi \cdot 1^2 \cdot 6$$

$$96 - 6\pi$$

$$77.150...$$

$$\boxed{77.2 \text{ in}^3}$$

5. Corey is using a paper cone to fill a cylinder with water. The cone has a radius of 3 cm and a height of 4 cm. The cylinder has a radius of 4 cm and a height of 6 cm. Determine the number of full cones of water needed to completely fill the cylinder.



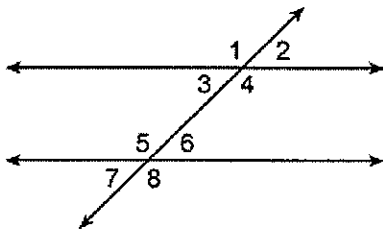
Cylinder  
 $V = \pi r^2 h$   
 $V = \pi \cdot 4^2 \cdot 6$   
 $V = 96\pi$

Cone  
 $V = \frac{1}{3} \pi r^2 h$   
 $V = \frac{1}{3} \cdot \pi \cdot 3^2 \cdot 4$   
 $V = 12\pi$

$$\frac{96\pi}{12\pi} = \boxed{8 \text{ cups}}$$

(Use the diagram to answer questions #6 - 8)

In the diagram shown, parallel lines are cut by a transversal.



6. Which special angle relationship best describes  $\angle 2$  and  $\angle 7$ ?

- A Corresponding Angles
- B Vertical Angles
- C Alternate Exterior Angles
- D Supplementary Angles

7. Which special angle relationship best describes  $\angle 3$  and  $\angle 7$ ?

- A Corresponding Angles
- B Vertical Angles
- C Alternate Exterior Angles
- D Alternate Interior Angles

8. Which special angle relationship best describes  $\angle 5$  and  $\angle 6$ ?

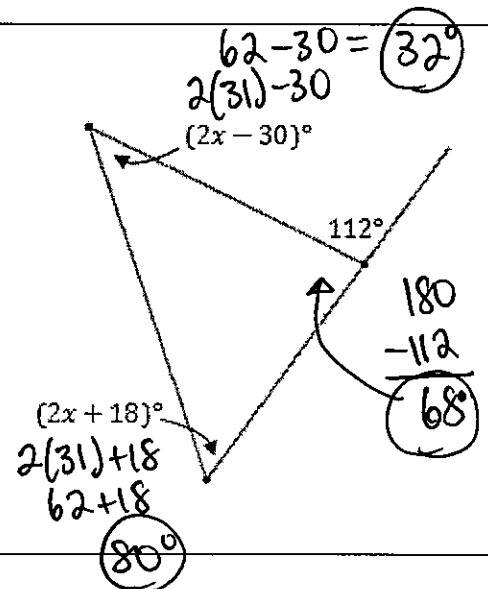
- A Corresponding Angles
- B Vertical Angles
- C Alternate Interior Angles
- D Supplementary Angles

9. Determine the measure of each interior angle of the triangle.

$$\underline{2x - 30} + \underline{2x + 18} + \underline{68} = 180$$

$$\begin{array}{r} 4x + 56 = 180 \\ -56 \quad -56 \\ \hline \end{array}$$

$$\begin{array}{r} 4x = 124 \\ \hline x = 31 \end{array}$$



10. In the diagram shown below, parallel lines are cut by a transversal. Determine the measure of all 8 angles in the diagram.

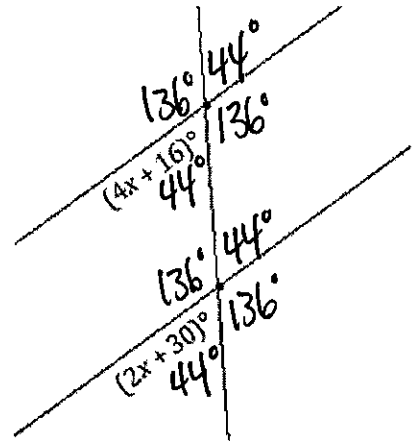
$$\begin{array}{r} 4x + 16 = 2x + 30 \\ -2x \quad -2x \\ \hline 2x + 16 = 30 \end{array}$$

$$\begin{array}{r} 2x + 16 = 30 \\ -16 \quad -16 \\ \hline 2x = 14 \end{array}$$

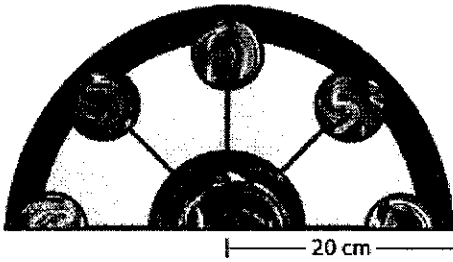
$$\frac{2x}{2} = \frac{14}{2}$$

$$x = 7$$

$$\begin{array}{r} 2(7) + 30 \\ 14 + 30 \\ 44 \end{array}$$



11. Find the perimeter in terms of  $\pi$ .

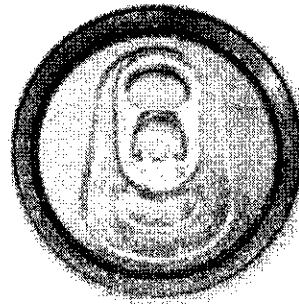


$$P = \frac{2\pi r}{2} + d$$

$$P = \pi \cdot 20 + 40$$

$$\boxed{20\pi + 40}$$

12. Determine the area to the nearest hundredth.



3 in.

$$A = \pi r^2$$

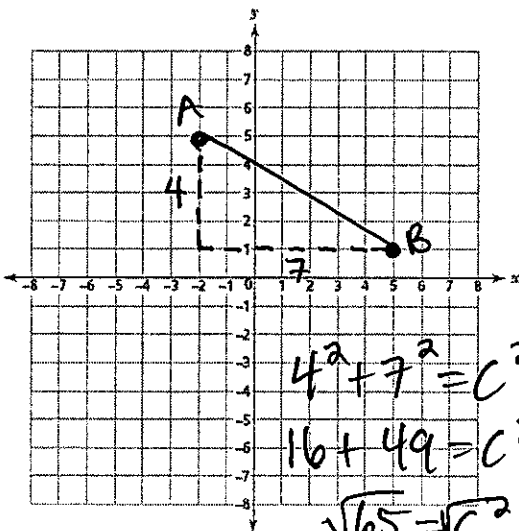
$$A = \pi \cdot 1.5^2$$

$$A = 2.25\pi$$

$$A = 7.068\dots$$

$$\boxed{7.07 \text{ in}^2}$$

13. Determine the distance between points  $A(-2, 5)$  and  $B(5, 1)$  to the nearest tenth. Show your work.



$$4^2 + 7^2 = c^2$$

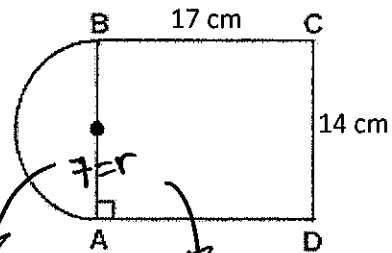
$$16 + 49 = c^2$$

$$\sqrt{65} = \sqrt{c^2}$$

$$c = 8.062\dots$$

$$\boxed{8.1 \text{ units}}$$

14. Figure ABCD consists of a rectangle and a semicircle. Determine the area of figure ABCD in terms of  $\pi$ . Show your work.



$$\frac{\pi r^2}{2}$$

$$+ l \cdot w$$

$$\frac{\pi \cdot 7^2}{2} + (17)(14)$$

$$\frac{49\pi}{2} + 238 = 314.969\dots$$

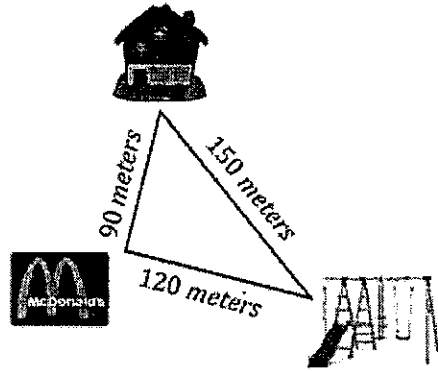
$$\boxed{314.97 \text{ cm}^2}$$

15. On Saturday afternoon, David went for a bike ride around town. The route he traveled is shown below. Determine if this route represents a right triangle. Show work to support your answer.

$$90^2 + 120^2 \stackrel{?}{=} 150^2$$

$$8100 + 14400 = 22500$$

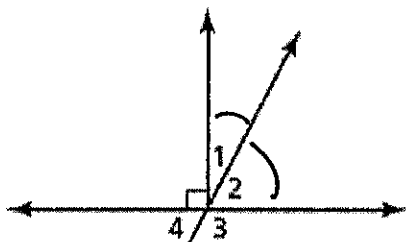
$$22500 = 22500 \checkmark$$



Explain: yes, this represents a right triangle b/c it satisfies the pythagorean theorem.

$$a^2 + b^2 = c^2 \checkmark$$

16. In the diagram below,  $\angle 1 = (3x + 1)^\circ$  and  $\angle 2 = (x + 45)^\circ$ . Find the value of  $x$ .



Complementary  
sum to  $90^\circ$

$$\underline{3x+1} + \underline{x+45} = 90$$

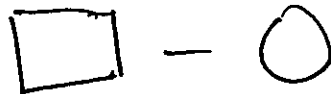
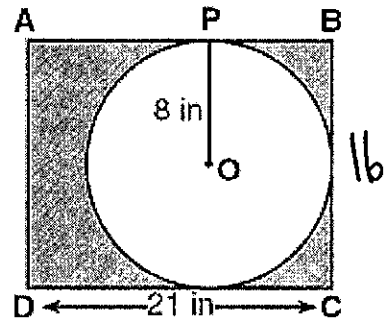
$$4x + 46 = 90$$

$$\underline{-46 \quad -46}$$

$$\frac{4x}{4} = \frac{44}{4}$$

$$x = 11$$

17. Determine the area of the shaded region to the nearest tenth.



$$L \cdot W - \pi r^2$$

$$(21) \cdot (21) - \pi \cdot 8^2$$

$$441 - 64\pi = 134.9 \text{ in}^2$$