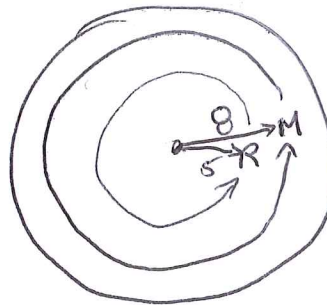
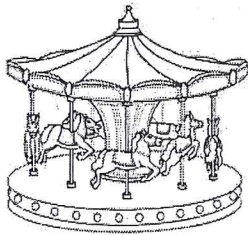


Unit 6 Problem Solving Review

Name Key

For each problem below, draw and label a diagram. Then explain with numbers or words your solution to each problem. Round your answer to the nearest unit. (Use 3.14 as an approximation for π).

1. Melanie rides the merry-go-round on her favorite horse on the outer edge, 8 meters from the center of the merry-go-round. Her sister, Rachel sits on the inner ring of horses, 3 meters from Melanie. In ten minutes, they go around 30 times. What is the average speed of each sister in ~~feet~~ meters per minute?



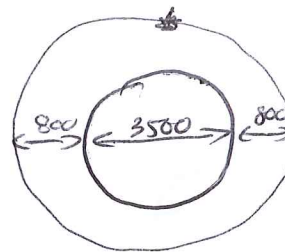
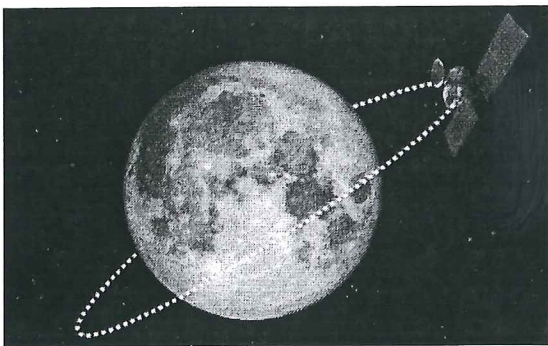
Rachel
 $r = 5m$
 $d = 10m$
 $C = 10\pi m$
 $C \approx 31.4m$

Melanie
 $r = 8m$
 $d = 16m$
 $C = 16\pi m$
 $C \approx 50.24m$

Rachel
 $speed \approx \frac{30(31.4)m}{10min}$
 $\approx 94.2m/min$

Melanie
 $speed = \frac{(50.24)(30)}{10min}$
 $= 150.72m/min$

2. A satellite is orbiting around the moon in a circular path. The diameter of the moon is about 3500 km. The satellite is orbiting 800 km above the surface of the moon. If it takes the satellite 34 minutes to travel all the way around the moon, how fast is it travelling in kilometers per minute? How fast in kilometers per hour. (Draw and label a diagram and round your answers to the nearest whole unit).

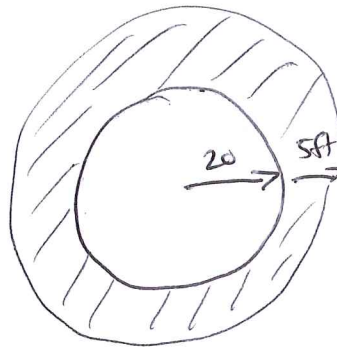
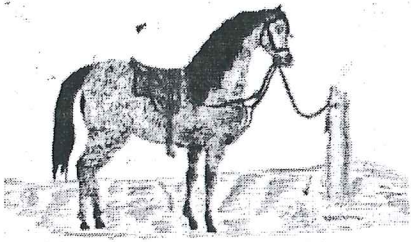


$$\begin{array}{r} 3500 \\ 800 \\ + 800 \\ \hline \end{array}$$
 $d = 5100 km$
 $C = 5100\pi km$
 $\approx 5100(3.14)$
 $\approx 16014 km$

$speed = \frac{16014 km}{34 min} = 471 \frac{km}{min}$

$speed = \frac{471 km}{1 min} \cdot \frac{60 min}{1 hr} = 28260 \frac{km}{hr}$

3. A horse is attached to a 20 ft. rope that is tied to a post. If the rope is lengthened to 25 ft., by what percentage does the horse's grazing area increase? Draw and label a diagram and round your answer to the nearest percent.



$$A_{\text{ring}} = \pi 25^2 - \pi 20^2$$

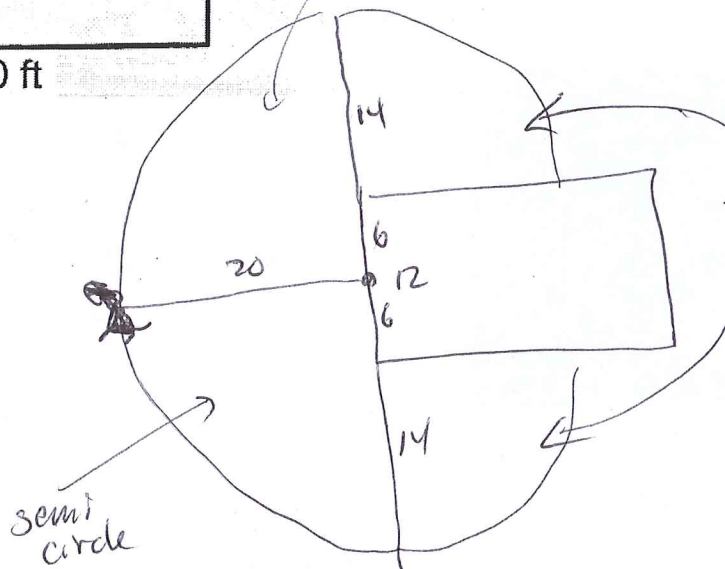
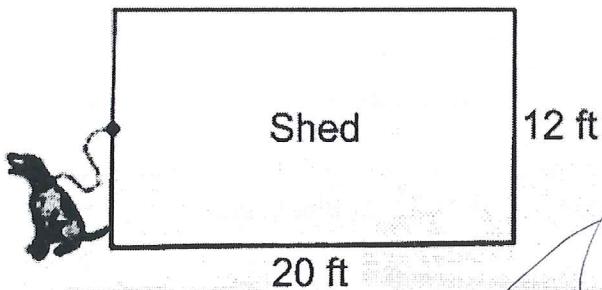
$$= 625\pi - 400\pi$$

$$= 225\pi \text{ ft}^2$$

$$A_{\text{small circle}} = \pi 20^2 = 400\pi$$

$$\% \text{ increase} = \frac{225\pi}{400\pi} = 56.25\%$$

4. Oswald's dog, Spot, is tied with a 20 ft rope to the center of the back wall of the shed. (See the diagram below). Over what area can spot play, to the nearest square foot?



$$\frac{\pi 20^2}{2} = \frac{400\pi}{2} = 200\pi$$

$$\frac{\pi 14^2}{2} = \frac{196\pi}{2} = 98\pi$$

$$\text{Total} = \frac{200\pi + 98\pi}{2}$$

$$\approx 298(3.14)$$

$$\approx 935.72 \text{ ft}^2$$

$$\approx 935.72 \text{ ft}^2$$