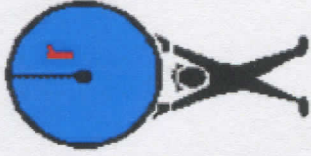


OBJECTIVE 1: Area of a Circle**Reminder from previous math courses: the formula is $A = \pi r^2$.** $r = \text{radius}$ $\pi = \text{pi}$ (exact leave it in the answer & for approximate use the pi button on the calculator)

TASK 1: Find the indicated measure(s).
 Give both the exact answer and the approximate answer to the thousandths.
 Be sure to include correct units.

a) area of a circle with a radius of 8.5 inches

$$\begin{aligned}
 A &= \pi(8.5)^2 \\
 &= \pi(72.25) \\
 &= 72.25\pi \text{ in}^2 \approx 226.980 \text{ in}^2
 \end{aligned}$$

b) diameter of a circle with an area of 153.94 square feet

$$\begin{aligned}
 153.94 &= \pi r^2 \\
 \sqrt{49.001} &= \sqrt{r^2} \\
 r &\approx 7 \\
 \boxed{d = 14 \text{ ft}}
 \end{aligned}$$

c) area of a circle with a radius of 4.5 meters

$$\begin{aligned}
 A &= \pi(4.5)^2 \\
 &= \pi(20.25) \\
 &= 20.25\pi \text{ m}^2 \approx 63.617 \text{ m}^2
 \end{aligned}$$

d) the radius of a circle with an area of 176.7 square feet

$$\begin{aligned}
 176.7 &= \pi r^2 \\
 \sqrt{56.245} &= \sqrt{r^2} \\
 r &\approx 7.4997 \\
 \boxed{r \approx 7.5 \text{ ft}}
 \end{aligned}$$

OBJECTIVE 2: Population Density

The population density of a city, county, or state is a measure of how many people live within a given area. The units are typically in square miles but can also be given in others like city blocks.

$$\text{Population Density} = \frac{\text{number of people}}{\text{area of land}}$$

TASK 2: Real-World Application

a) About 124,000 people live in a two-mile radius of a city's post office. Find the population density in people per square mile.

$$PD = \frac{124,000}{\pi(2)^2} \approx 9,867.606 \quad \approx 9868 \text{ people per square mi.}$$

b) A region with a ten-mile radius has a population density of about 869 people per square mile. Find the number of people who live in the region.

$$869 = \frac{x}{100\pi} \quad x \approx 273,004.402 \quad \approx 273,004 \text{ people}$$

c) About 58,000 people live in a region with a two-mile radius. Find the population density in people per square mile.

$$A = 2^2 \pi \quad \frac{58,000}{4\pi} \approx 45,553.093 \quad 45,553 \text{ people per square mile}$$

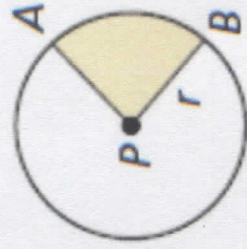
d) A region with a three-mile radius has a population density of about 1000 people per square mile. Find the number of people who live in the region.

$$\frac{100}{1} = \frac{x}{9\pi} \quad x \approx 2827.433 \quad 2,827 \text{ people}$$

OBJECTIVE 3: Area of a Sector

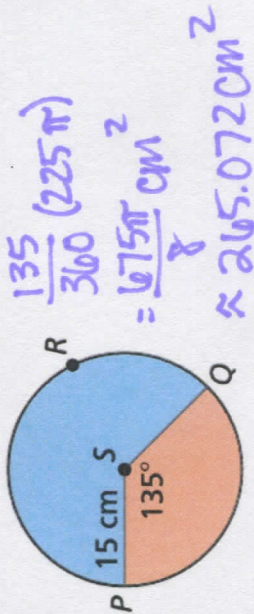
The ratio of the area of a sector of a circle to the area of the whole circle is equal to the ratio of the measure of the intercepted arc to 360° .

$$A = \frac{m\widehat{AB}}{360^\circ} \cdot (\pi r^2)$$



TASK 3: Area of sectors

a) Find the areas of the sectors formed by $\angle PSQ$.

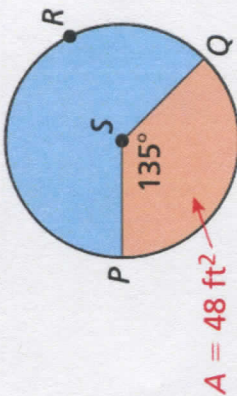


$$48 = \frac{135}{360} (A)$$

$$17280 = 135 (A)$$

$$128 \text{ ft}^2$$

b) Find the area of $\odot S$



OBJECTIVE 4: Composite Shapes

Split the composite shapes into smaller shapes you know and set up a plan to either add or subtract the smaller shapes to create the area of the larger shape.

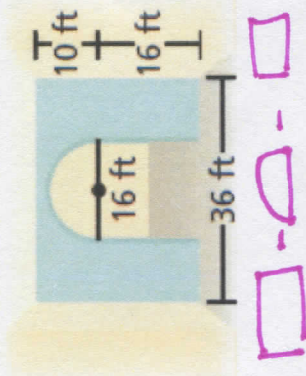
TASK 4: Area of Composite Shapes

A rectangular wall has an entrance cut into it. You want to paint the wall. To the nearest square foot, what is the area of the region you need to paint?

$$36(26) - (64\pi) - 256$$

$$936 - 201.062 - 256 \approx 478.938$$

$$479 \text{ ft}^2$$



TASK 5: Area of Shaded Regions

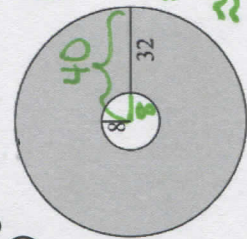
Big - Little to find the shaded region. Set up a plan.

a) $(40^2)\pi - (8^2)\pi$

$$1600\pi - 64\pi$$

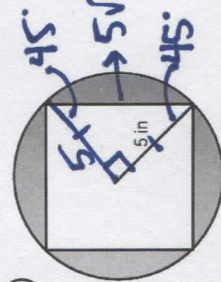
$$= 1536\pi \text{ u}^2$$

$$\approx 4825.486 \text{ u}^2$$



$$5^2 + 5^2 = x^2$$

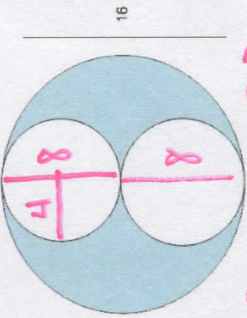
$$\odot - \square$$



$$= 25\pi - 50 \text{ in}^2$$

$$\approx 28.540 \text{ in}^2$$

$$\odot - 2\odot$$



$$(16)^2\pi - 2(8^2)\pi$$

$$256\pi - 32\pi$$

$$= 224\pi \text{ mm}^2$$

$$\approx 703.717 \text{ mm}^2$$

Still need help with: