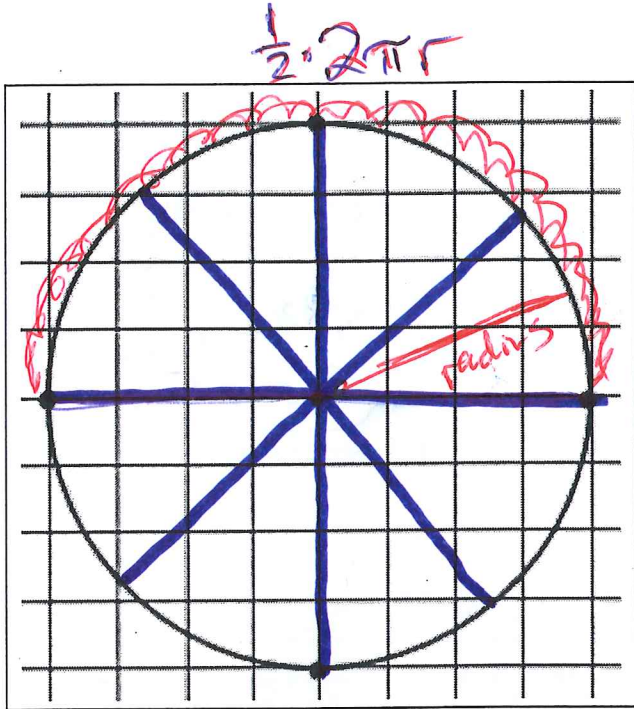
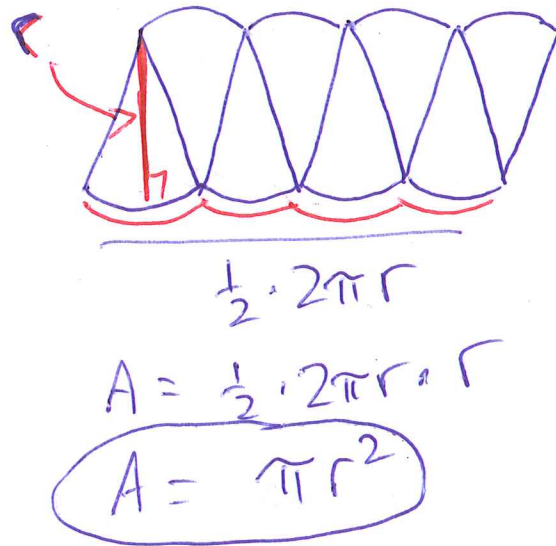


How can we derive a FORMULA for the area of a circle??



$$A = b/2 + i - 1$$



Circle Area Conjecture

C-81

The area of a circle is given by the formula:

$$A = \pi r^2$$

$$A = \frac{\text{Area}}{\text{radius}}$$

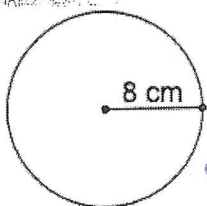
π = answer can be left in terms of π or use 3.14 for a decimal approximation.

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Examples:

Find the areas of the circles below. LEAVE YOUR ANSWERS IN TERMS OF π

1.



$$r = 8$$

$$A = 64\pi \text{ cm}^2$$

2. If $d = 6.8\text{m}$ then $A =$ _____

$$d = 6.8$$

$$r = 3.4$$

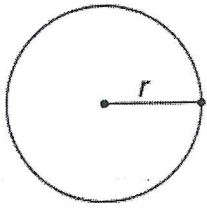
$$A = \pi (3.4)^2$$

$$A = 11.56\pi \text{ m}^2$$

More examples:

Use the area formula to "work backwards" to find the radius.

3.



$$A = 121 \pi \text{ cm}^2$$

$$r = \underline{\hspace{2cm}}$$

$$\frac{\sqrt{121\pi}}{\pi} = \frac{\pi\sqrt{r^2}}{\pi}$$

$$\pm\sqrt{121} = r$$

$$11 = r$$

4.

$$\text{If } A \approx 277.4504 \text{ m}^2$$

$$\text{Then } r \approx \underline{\hspace{2cm}}$$

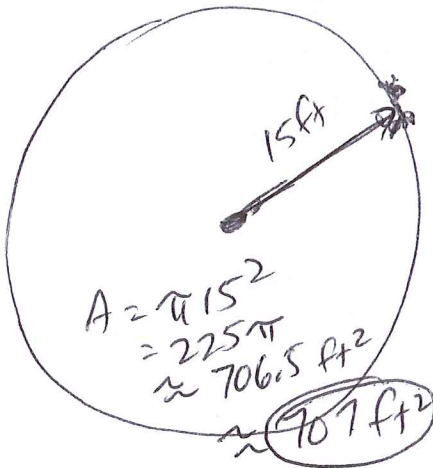
$$\frac{277.4504}{3.14} = \frac{(3.14)r^2}{3.14}$$

$$\sqrt{88.36} = \sqrt{r^2}$$

$$9.4 \approx r$$

Problem Solving

5. Fluffy the dog is tied to a post in the backyard by a chain that is 15 ft. long. About how much area does Fluffy have to move around in? Round your answer to the nearest square foot. (Use 3.14 for π)



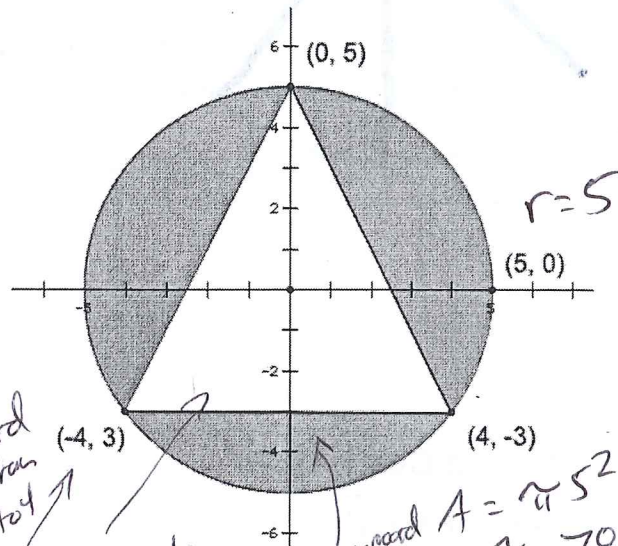
$$A = \pi 15^2$$

$$= 225\pi$$

$$\approx 706.5 \text{ ft}^2$$

$$\approx \underline{707 \text{ ft}^2}$$

6. Find the area of the shaded region



x-coord goes from -4 to 4

Triangle base = 8 height = 8

$$\text{Area} = \frac{1}{2}(8)(8) = 32 \text{ u}^2$$

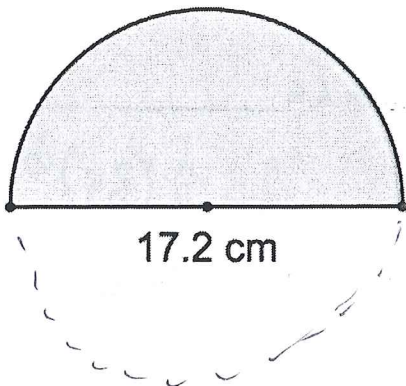
y-coord goes from -3 to 5

$$A = \pi 5^2 = 25\pi$$

$$\approx 78.5 \text{ u}^2$$

$$\text{shaded Area} = \frac{78.5 - 32.0}{1} = \underline{46.5 \text{ u}^2}$$

7. Find the shaded area in terms of π



$$d = 17.2$$

$$r = 8.6$$

$$\text{Area} = \frac{\pi (8.6)^2}{2}$$

div by 2 half of a circle

$$\approx \frac{73.96\pi}{2} \approx \underline{116.11 \text{ cm}^2}$$