

① What is the area of the circle by Monte Carlo estimate?

Goal (unknown) or to find: Area of circle

Input, known or Given:

- ② 97 cows in the circle  
903 houses outside circle
- ③ 1000 turtles (darts) were used
- ④ 1089 is area in patches of the entire 33 by 33 turtle grid.
- ⑤ ②, ③, ④ Given
- ⑥ Goal

$$a = \frac{b}{c} d$$

⑥ Goal

$$a = \frac{97}{1000} (1089) = (0.097)(1089)$$

area of circle is = 105.633

② What is the radius of the circle using the Monte Carlo estimate of area

$$\left(\frac{97}{1000}\right)(1089) = 105.633$$

$$\text{area} = (3.14159) \text{radius}^2$$

$$\frac{105.633}{3.14159} = \text{radius}^2$$

$$\sqrt{\frac{105.633}{3.14159}} = \text{radius}$$

$$\sqrt{33.624} = \text{radius}$$

$$5.7986 = \text{radius}$$

$$\boxed{5.8} = \text{radius}$$

$$\text{area} = \pi r^2$$

↑                    ↑                    ↑

$\boxed{105.633}$                      $\boxed{3.14159}$                      $\boxed{\text{unknown or goal}}$