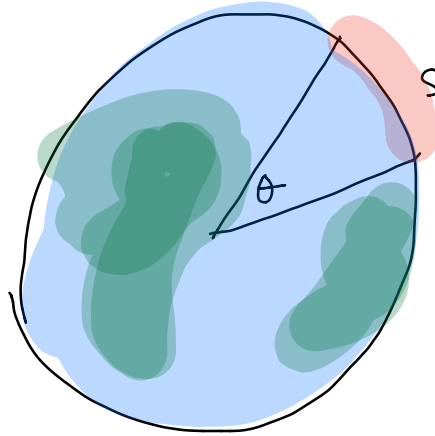
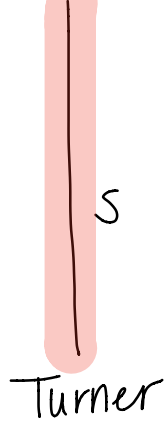


Station 1

Answer 748 miles

Canada



$$49.8833 - 39.07583 = \theta$$

$$\theta = 10.80747$$

Want to know S

→ Arc Length  $S = \theta r$

radius of Earth (look it up) = 3961.3 miles

$$S = \theta (3961.3)$$

↑

in radians!  $10.80747^\circ \left( \frac{\pi}{180} \right) = 0.18853$

$$S = (0.18853)(3961.3) \approx 748$$

## Station 2 1.05 mm

Want Arc length

$$s = \theta r$$

$$\theta = 10^\circ = \frac{10^\circ \pi}{180}$$

$$r = 6 \text{ mm} \quad (\text{b/c } D = 12 \text{ mm})$$

$$s = \left( \frac{10^\circ \pi}{180} \right) (6 \text{ mm}) = 1.05 \text{ mm}$$

## Station 3 Answer = 146 in

$$s =$$

$$\theta = 3.42 \pi$$

$$r = 13.6$$

$$s = \theta r$$

$$= (3.42 \pi)(13.6)$$

$$= 146 \text{ in}$$

$$s = 4.72 \pi$$

$$\theta =$$

$$r = 1.38$$

$$\theta = \frac{s}{r} =$$

$$\frac{4.72 \pi}{1.38} \approx 3.42 \pi$$

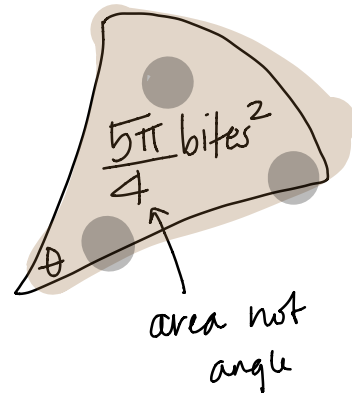
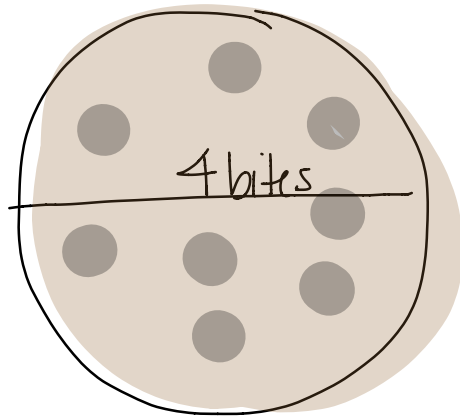
$$\theta = 180^\circ = \pi$$

$$s =$$

$$r = 4.72$$

$$s = \theta r = 4.72 \pi$$

Station 4 Central Angle:  $112.5^\circ \approx \frac{1}{3}$  eaten



$$A = \frac{\theta r^2}{2}$$

$$\theta =$$

$$r =$$

$$A =$$

$$\frac{5\pi}{4} = \frac{\theta(2)^2}{2}$$

$$\frac{5\pi}{4} = \frac{4\theta}{2} = 2\theta$$

$$\frac{5\pi}{4} = 2\theta \Rightarrow \frac{1}{2} \cdot \frac{5\pi}{4} = \theta$$

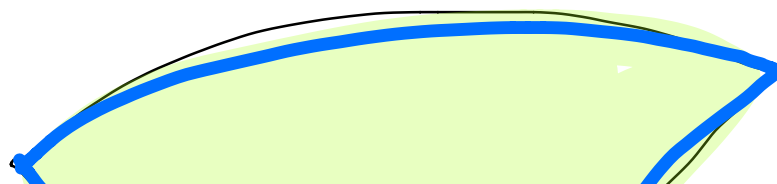
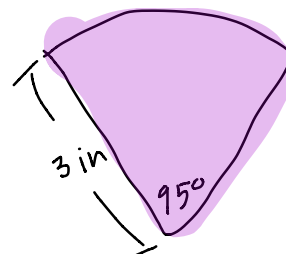
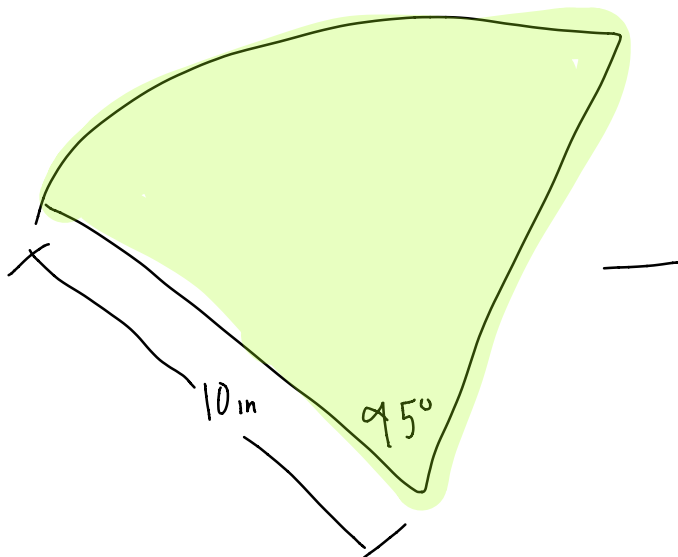
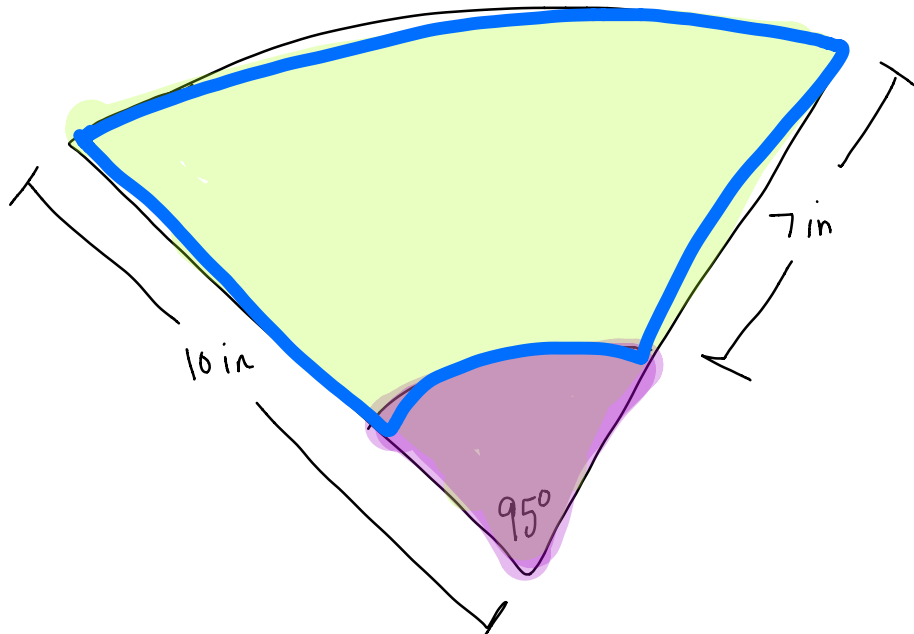
$$\theta = \frac{5\pi}{8} \text{ radians}$$

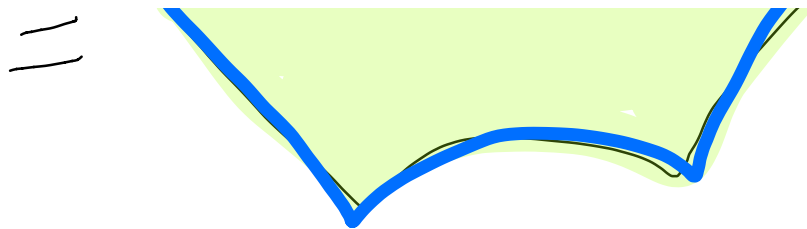
$$\text{find } \theta \text{ in degrees } \frac{5\pi}{8} \cdot \frac{180^\circ}{\pi} = 112.5^\circ$$

$$\text{What fraction has been eaten? } \frac{112.5}{360} \approx \frac{1}{3}$$

Station 5

Answer:  $75.44 \text{ in}^2$





$$A = \frac{1}{2} \left( 95^\circ \frac{\pi}{180^\circ} \right) (10)^2 - \frac{1}{2} \left( 95^\circ \frac{\pi}{180^\circ} \right) (3)^2$$
$$= 75.44 \text{ in}^2$$