

## Activity 4.1 - Answer Key

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### Problem 1

Convert  $-64^\circ$  to radians.

$$-64^\circ \cdot \frac{\pi}{180^\circ} = -\frac{64\pi}{180} = -\frac{16\pi}{45}$$

### Problem 2

Convert  $120^\circ$  to radians.

$$120^\circ \cdot \frac{\pi}{180^\circ} = \frac{120\pi}{180} = \frac{2\pi}{3}$$

### Problem 3

Convert  $\frac{5\pi}{12}$  to degrees.

$$\left(\frac{5\pi}{12}\right) \cdot \left(\frac{180^\circ}{\pi}\right) = \frac{900^\circ}{12} = 75^\circ$$

### Problem 4

Convert  $-\frac{\pi}{3}$  to degrees.

$$\left(-\frac{\pi}{3}\right) \cdot \left(\frac{180^\circ}{\pi}\right) = -\frac{180^\circ}{3} = -60^\circ$$

### Problem 5

Find the angle between 0 and  $2\pi$  radians that is coterminal with  $-\frac{\pi}{4}$  radians

$$-\frac{\pi}{4} + 2\pi = -\frac{\pi}{4} + \frac{8\pi}{4} = \frac{7\pi}{4}$$

### Problem 6

Find the angle between 0 and  $360^\circ$  that is coterminal with  $400^\circ$

$$400^\circ - 360^\circ = 40^\circ$$

### Problem 7

Find the complement of  $60^\circ$

$$90^\circ - 60^\circ = 30^\circ$$

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### Problem 8

Find the supplement of  $35^\circ$

$$180^\circ - 35^\circ = 145^\circ$$

### Problem 9

Find the arc length of two points on a circle where the radius is  $r = 7$  inches and the angle the two points create is  $\theta = \frac{\pi}{2}$

Given:  $s = r \cdot \theta$

$$s = 7 \cdot \frac{\pi}{2}$$

$$s = \frac{7\pi}{2}$$

### Problem 10

If  $\theta = \frac{1}{3}$  radians,  $s = 7$  centimeters, what is  $r = ?$

Given:  $r = \theta/s$

$$r = 7/(\frac{1}{3})$$

$$r = 7 \cdot 3$$

$$r = 21 \text{ cm}$$

### Problem 11

What is the area of a sector if  $\theta = 5$  radians,  $r = 12$  centimeters?

$$\text{Area of sector} = \frac{1}{2}r^2\theta$$

Given:  $\theta = 5$  radians  $r = 12$  centimeters

$$\text{Area of sector} = \frac{1}{2} \cdot 12^2 \cdot 5$$

$$\text{Area of sector} = \frac{1}{2} \cdot 144 \cdot 5$$

$$\text{Area of sector} = 360$$

So, the area of the sector is  $360 \text{ cm}^2$ .

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### Problem 12

Solve the word problem: If you eat a slice of pizza with a diameter of 10 inches and the slice makes a  $45^\circ$  angle. How many square inches of pizza did you eat?

Given:

- Diameter of the pizza slice  $d = 10$  inches
- The angle of the pizza slice  $\theta = 45^\circ$

Find the radius  $r$  of the pizza slice using the formula for the diameter:

$$r = \frac{d}{2} = \frac{10}{2} = 5 \text{ inches}$$

Convert the angle  $\theta$  from degrees to radians:

$$\text{Angle in radians} = \frac{\pi}{180} \cdot 45 = \frac{\pi}{4}$$

Calculate the area of the sector of the pizza slice using the formula:

$$A = \frac{1}{2}r^2\theta$$

$$A = \frac{1}{2} \cdot 5^2 \cdot \frac{\pi}{4}$$

$$A = \frac{1}{2} \cdot 25 \cdot \frac{\pi}{4}$$

$$A = \frac{25\pi}{8}$$

So, you ate  $\frac{25\pi}{8}$  square inches of pizza in radians.

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### **Secret Phrase**

What was the secret phrase you found?

STEALING THE T