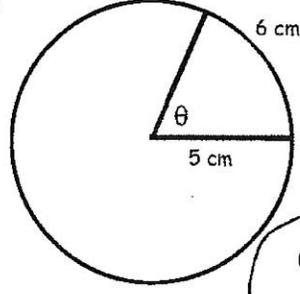
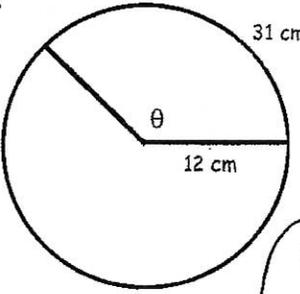
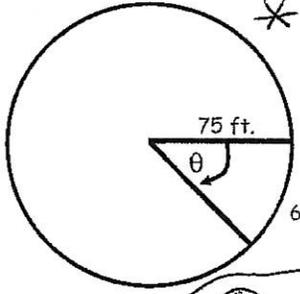


4.1 Homework-Day 3 (Arc Length & DMS)

Find the angle in radians.

<p>1.</p>  <p>6 cm</p> <p>5 cm</p> <p>$S = r\theta$ $6 = 5\theta$ $\frac{6}{5} = \theta$</p> <p>$\theta = \frac{6}{5}$ RADIANS OR 1.2 RADS</p>	<p>2.</p>  <p>31 cm</p> <p>12 cm</p> <p>$S = r\theta$ $31 = 12\theta$ $\frac{31}{12} = \theta$</p> <p>$\theta = \frac{31}{12}$ RADIANS OR 2.583 RADS</p>
<p>3. radius is 7 meters arc length is 32 meters</p> <p>$S = r\theta$ $32 = r\theta$ $32 = 7\theta$ $\frac{32}{7} = \theta$</p> <p>$\theta = \frac{32}{7}$ RADIANS OR 4.571 RADS</p>	<p>4. * negative Δ</p>  <p>75 ft.</p> <p>60 ft.</p> <p>$S = r\theta$ $60 = 75\theta$ $\frac{60}{75} = \theta$</p> <p>$\theta = -\frac{4}{5}$ RADIANS OR -0.8 RADS</p>

Find the length of the arc.

<p>5. radius is 14 inches central angle θ is 180°</p> <p>$S = r\theta$ $180^\circ \cdot \frac{\pi}{180^\circ} = \pi$</p> <p>$S = 14\pi$ $\theta = \pi$</p> <p>$S = 14\pi \approx 43.982$ inches</p>	<p>6. radius is 12 centimeters central angle θ is $\frac{3\pi}{4}$</p> <p>$S = r\theta$ $S = 12 \left(\frac{3\pi}{4} \right)$</p> <p>$S = 9\pi \approx 28.274$ cm</p>
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Find the radius.

<p>7. arc length is 36 feet central angle θ is $\frac{\pi}{2}$</p> <p>$S = r\theta$ $36 = r \left(\frac{\pi}{2} \right)$ $\frac{2}{\pi} \cdot 36 = r$ $\frac{72}{\pi} = r$</p> <p>$r = \frac{72}{\pi} \approx 22.918$ ft</p>	<p>8. arc length is 82 miles central angle θ is 135°</p> <p>$S = r\theta$ $135^\circ \cdot \frac{\pi}{180^\circ}$ $82 = r \left(\frac{3\pi}{4} \right)$ $\frac{135\pi}{180} = \frac{3\pi}{4}$</p> <p>$\frac{4}{3\pi} \cdot 82 = r$ $\frac{328}{3\pi}$</p> <p>$r = \frac{328}{3\pi} \approx 34.802$ mi</p>
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Use your graphing calculator to convert the angle measure to decimal degree form. Round your answer to three decimal places if necessary.

<p>9. $64^{\circ}45'$</p> <p>64.75°</p>	<p>10. $85^{\circ}18'30''$</p> <p>85.308°</p>	<p>11. $-125^{\circ}36''$</p> <p>$-(125^{\circ} + 0' + 36'')$</p> <p>$-125.01$</p>
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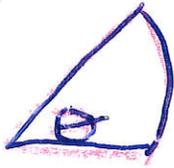
Use your graphing calculator to convert the angle measure to $D^{\circ}M'S''$ form.

<p>12. 280.6°</p> <p>$280^{\circ} 36' 0''$</p>	<p>12. -345.12°</p> <p>$-345^{\circ} 7' 12''$</p>	<p>14. -0.355 RADIANS !</p> <p>$-0.355 \left(\frac{180^{\circ}}{\pi} \right) = (-20.3400173)$</p> <p>Dms \rightarrow $-20^{\circ} 20' 24.006''$</p>
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4.1 Sector Area Name: _____

Key

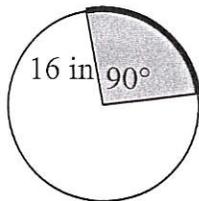
Area of a Sector

		<p>The # of square units in one slice of pie.</p>
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<p>Area of Sector</p> $A = \frac{\theta}{360^\circ} \pi r^2$ <p>where θ is in degrees</p> $A = \frac{1}{2} r^2 \theta$ <p>where θ is in radians</p>
<p>Area of Segment = Area of Sector - Area of Triangle</p>

1. Calculate the sector area:

a. Using degrees



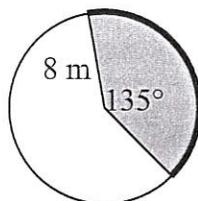
$$A = \frac{90}{360} \pi (16)^2$$

$$A = \frac{1}{4} \pi (16)(16)$$

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

≈

b. Using radians



$$135^\circ \cdot \frac{\pi \text{ rad}}{180^\circ}$$

$$= \frac{135\pi}{180}$$

$$= \frac{3\pi}{4}$$

$$A = \frac{1}{2} (8)(8) \frac{3\pi}{4}$$

$$= (4)(2)(3\pi)$$

$$= 24\pi \text{ m}^2$$

≈

4.1 Sector Area Name: _____

Degrees

2. Find the measure of the central angle of a sector if its area is 5π and the radius is 6.

$$A = \frac{\theta}{360} \cdot \pi r^2$$

$$5\pi = \frac{\theta}{360} \cdot 36\pi$$

$$5\pi = \frac{\theta\pi}{10}$$

$$50\pi = \theta\pi$$

$$50^\circ = \theta$$

$$50^\circ \cdot \frac{\pi}{180^\circ}$$

$$= \frac{5\pi}{18} \text{ rad.}$$

3. The central angle of a sector is 72° and the sector has an area of 5π . Find the radius.

$$A = \frac{72^\circ}{360^\circ} \cdot \pi r^2$$

$$5\pi = \frac{1}{5} \pi r^2$$

$$25\pi = \pi r^2$$

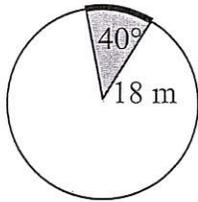
$$25 = r^2$$

$$r = \pm\sqrt{25}$$

$$r = 5$$

PRACTICE:

1. Find the area of the sector



$$r = 18$$

$$\theta = 40^\circ$$

$$A = \frac{40}{360} \pi r^2$$

$$A = \frac{1}{9} \pi (18)^2$$

$$A = \frac{324\pi}{9} = 36\pi$$

2. The area of a circle is 225π square inches. Find the area of the sector whose central angle is 45° .

$$\pi r^2 = 225\pi$$

$$\theta = 45^\circ$$

$$A = \frac{45}{360} \cdot 225\pi$$

$$A = \frac{1}{8} \cdot 225\pi = \frac{225\pi}{8}$$

3. A circle has a radius of 12. Find the area of the sector whose central angle is 120° .

$$\text{OR } A = \frac{1}{3} \pi \cdot 144$$

$$r = 12$$

$$A_{\text{sec}} = 120^\circ \text{ or } \frac{2\pi}{3}$$

$$A = \frac{2\pi}{3}$$

$$= \frac{\pi}{3} \cdot 144$$

4. Find the radius of a circle which has a sector area of 9π whose central angle is 90° .

$$A = 9\pi$$

$$\theta = 90^\circ \text{ or } \frac{\pi}{4}$$

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

$$9\pi = \frac{1}{4} \pi r^2$$

$$= \frac{144\pi}{3}$$

$$36\pi = \pi r^2$$

$$36 = r^2$$

$$r = 6$$