

HW 28 Solutions #1-5, 7-9, 15

1.) Find the area of a sector formed by $\theta = \frac{1}{12}$ rad in a circle w/ radius 12cm.

* Fraction of the circle that's the sector: $\frac{\frac{1}{12}}{2\pi} = \frac{1}{24\pi}$

* Area of the circle: $\pi 12^2 = 144\pi \text{ cm}^2$

* Area of the sector: $\frac{144\pi}{24\pi} \times \frac{1}{1} = \boxed{6 \text{ cm}^2}$

2.) radius is 30in and $\theta = \frac{\pi}{5}$ radians

* Fraction of the circle that's the sector: $\frac{\frac{\pi}{5}}{2\pi} = \frac{1}{10}$

* Area of the circle: $\pi (30)^2 = 900\pi \text{ in}^2$

* Area of the sector: $900\pi \times \frac{1}{10} = \boxed{90\pi \text{ in}^2}$

3.) radius is 8m and $\theta = 60^\circ$

* Fraction of the circle that's the sector: $\frac{60^\circ}{360^\circ} = \frac{1}{6}$

* Area of the circle: $8^2\pi = 64\pi \text{ m}^2$

* Area of the sector: $\frac{64\pi}{6} \times \frac{1}{3} = \boxed{\frac{32\pi}{3} \text{ m}^2}$

4.) diameter = 16in. $\theta = 32^\circ$

* Fraction of the pizza that's the slice: $\frac{32}{360} = \frac{4}{45}$

* Area of pizza: $\pi 8^2 = 64\pi \text{ in}^2$

* Area of the sector: $\frac{4}{45} \times 64\pi = \boxed{\frac{256\pi}{45} \text{ in}^2}$

5.) Sector has area 30 ft^2 . radius is 7 ft . What's θ ?

Area of circle: $49\pi \text{ ft}^2$

fraction that's sector: $\frac{30 \text{ ft}^2}{49\pi \text{ ft}^2} = \frac{\theta}{2\pi} \leftarrow \text{radians}$

$\theta = \frac{60}{49} \text{ radians}$

7.) $\theta = \frac{\pi}{10}$, $r = 30 \text{ in}$.

* fraction of circle that's the sector: $\frac{\frac{\pi}{10}}{2\pi} = \frac{1}{20}$

* Circumference of the circle: 60π

* arc of sector: $60\pi \times \frac{1}{20} = \boxed{3\pi \text{ in}}$

8.) $\theta = \frac{4\pi}{3}$, $r = 54 \text{ cm}$

* fraction of circle that's the sector: $\frac{\frac{4\pi}{3}}{2\pi} = \frac{2}{3}$

* Circumference of circle: $108\pi \text{ cm}$

* arc of sector: $108\pi \times \frac{2}{3} = 72\pi \text{ cm}$

9.)

$$\theta = \frac{5\pi}{6} \quad r = 31 \text{ m}$$

* Fraction of circle: $\frac{\frac{5\pi}{6}}{2\pi} = \frac{5}{12}$

* Circumference: $62\pi \text{ m}$

* Arc: $62\pi \times \frac{5}{12} = \frac{155\pi}{6} \text{ m}$

15.)

$$\omega = \frac{5}{360} \times \frac{\pi \text{ radians}}{180^\circ} \times \frac{60}{1} = 300\pi \text{ radians} / 1 \text{ min}$$

↑
Conversion