## NOTES 11.2
ARC LENGTH & AREA OF SECTORS

Definition	Formula
ARC LENGTH: a part of the circumference of a circle	$\text{ARC LENGTH} = \dfrac{x°}{360°} \cdot 2\pi r$ x = measure of $\overset{\frown}{}$ r = radius

EXAMPLE 1: Find the length of $\overset{\frown}{EF}$ below.
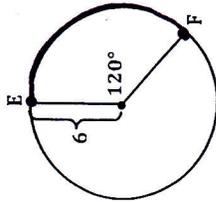
$$\frac{120}{360} \cdot 2\pi(6)$$
$$\frac{1}{3} \cdot \frac{12\pi}{1}$$
$$\frac{12\pi}{3}$$

$$\overset{\frown}{EF} = \underline{4\pi}$$

EXAMPLE 2: Find the length of $\overset{\frown}{LM}$ below.
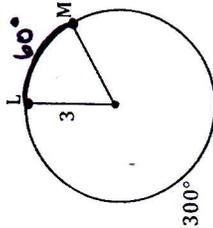
$$\frac{60}{360} \cdot 2\pi(3)$$
$$\frac{1}{6} \cdot \frac{6\pi}{1}$$
$$\frac{6\pi}{6}$$

$$\overset{\frown}{LM} = \underline{\pi}$$

| Definition	Formula
SECTOR: a slice of a circle bounded by 2 radii and an arc	$\text{SECTOR AREA} = \dfrac{x°}{360°} \cdot \pi r^2$

EXAMPLE 3: Find the area of the sector below.
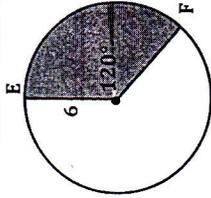
$$\frac{120}{360} \cdot \pi(6)^2$$
$$\frac{1}{3} \cdot \frac{36\pi}{1}$$
$$\frac{36\pi}{3}$$

Sector Area = $\underline{12\pi}$

EXAMPLE 4: Find the length of $\overset{\frown}{AB}$ and the area of the sector.
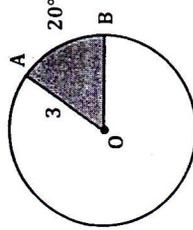
$$\overset{\frown}{AB} = \frac{20}{360} \cdot 2\pi(3) = \frac{1}{18} \cdot \frac{6\pi}{1} = \frac{6\pi}{18}$$

$$\overset{\frown}{AB} = \underline{\frac{\pi}{3}}$$

$$\text{Sector Area} = \frac{20}{360} \cdot \pi(3)^2 = \frac{1}{18} \cdot \frac{9\pi}{1} = \frac{9\pi}{18}$$

Sector Area = $\underline{\frac{\pi}{2}}$

EXAMPLE 5: Find the length of $\overset{\frown}{AB}$ and the area of the sector.
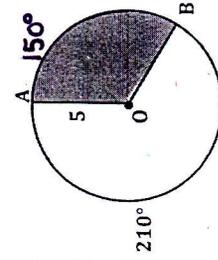
$$\overset{\frown}{AB} = \frac{150}{360} \cdot 2\pi(5) = \frac{5}{12} \cdot \frac{10\pi}{1} = \frac{50\pi}{12}$$

$$\overset{\frown}{AB} = \underline{\frac{25\pi}{6}}$$

$$\text{Sector Area} = \frac{150}{360} \cdot \pi(5)^2 = \frac{5}{12} \cdot \frac{25\pi}{1} = \frac{125\pi}{12}$$

Sector Area = $\underline{\frac{125\pi}{12}}$

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