

4.1 Radian Measure

BLM 4-2

- Determine the exact radian measure for each angle.
 - 65°
 - 170°
 - 240°
 - 132°
 - 351°
- Determine the approximate radian measure, to the nearest hundredth, for each angle.
 - 47°
 - 218°
 - 335°
 - 165°
 - 73°
- Determine the approximate degree measure, to the nearest tenth, for each angle.
 - $\frac{2\pi}{7}$
 - $\frac{5\pi}{4}$
 - $\frac{7\pi}{8}$
 - $\frac{5\pi}{9}$
 - $\frac{4\pi}{11}$
- An arc of a circle measuring 22.5 cm subtends a central angle of $\frac{4\pi}{3}$ radians.
Find the approximate radius of the circle, to the nearest tenth of a centimetre.
- In an obtuse triangle, where each angle has a different measure, one angle measures 3 times the smallest angle and the largest angle measures 5 times the smallest angle. Determine the exact radian measures of each angle in the triangle.
- The power take-off shaft of an agricultural tractor is often programmed to run at 540 rpm (revolutions per minute) in order to improve fuel economy. Find an exact value, as well as an approximate value, to two decimal places, for the angular velocity of the shaft in radians per second.
- During a bicycle race, the back wheel of Dillon's bicycle rotates 150 times in 1 min. Determine the exact angular velocity of the wheel in
 - degrees per second
 - radians per second
- A person on a Ferris wheel makes one complete revolution in 8 min. Calculate the approximate angular velocity of the person in radians per second, to two decimal places.
- The following proportion is true:

$$\frac{\text{sector area}}{\text{area of circle}} = \frac{\text{central angle}}{\text{one revolution angle}}$$
 - Use this proportion to derive a formula for the radius, r , of the circle, in terms of the sector area, A , and the central angle θ .
 - Use that formula to determine the radius, to the nearest tenth of a centimetre, if the area of the sector is 36 cm^2 and the central angle is $\frac{\pi}{4}$.