

Radian Measure and Arc Length

Find the radian measure for the following.

1. Given a circle of radius 35 mi. An angle intercepts an arc of 20 mi. Express the central angle θ in radians.
2. Given a circle of radius 50 in. An angle intercepts an arc of 35 in. Express the central angle θ in radians.
3. Given a circle of radius 35 yd. An angle intercepts an arc of 10 yd. Express the central angle θ in radians.
4. Given a circle of radius 80 mi. An angle intercepts an arc of 75 mi. Express the central angle θ in radians.
5. Given a circle of radius 13 ft. An angle intercepts an arc of 30 ft. Express the central angle θ in radians.
6. Given a circle of radius 3 yd. An angle intercepts an arc of 8 yd. Express the central angle θ in radians.
7. Given a circle of radius 6 mm. An angle intercepts an arc of 11 mm. Express the central angle θ in radians.
8. Given a circle of radius 14 m. An angle intercepts an arc of 24 m. Express the central angle θ in radians.

Find the arc lengths of the following:

1. Given a clock whose minute hand is 16 cm long, how far does the tip of the hand move during 15 min?
2. Given a clock whose minute hand is 6 cm long, how far does the tip of the hand move during 29 min?
3. Given a clock whose minute hand is 3 cm long, how far does the tip of the hand move during 53 min?
4. In a circle with a 12-m radius, how long is an arc associated with a central angle of 2.6 radians?
5. In a circle with a 2.3-ft radius, how long is an arc associated with a central angle of 3.1 radians?
6. In a circle with a 36-cm radius, how long is an arc associated with a central angle of 0.24 radians?