

## Watch. Practice. Understand. | Lesson 060

2021 The Heart and the Soul of Central Angle, Intercepted Arc and Arc Length (Geometry...

Watch the matching video: <https://www.youtube.com/watch?v=AdLWDdZod3g>

Practice focus: Arc length, sectors and angular speed

Original extra practice matched to the listed lesson topic.

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Show your reasoning and check units.

**01** Find the arc length in a radius-6 circle subtended by angle  $2\pi/3$  radians.

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**02** Find the area of that sector.

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**03** A wheel turns 30 revolutions per minute. Find angular speed in radians per second.

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**04** A radius-0.4-m wheel rotates at 5 rad/s. Find its rim's linear speed.

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Practice focus: Circles, chords and equations

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Name: \_\_\_\_\_ Date: \_\_\_\_\_ Show your reasoning and check units.

**05** Write the circle with center (2, -3) and radius 5.

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**06** Find the center and radius of  $x^2 + y^2 - 6x + 4y - 12 = 0$ .

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**07** A chord of a radius-5 circle is 3 units from the center. Find its length.

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**08** An inscribed angle intercepts an arc measuring  $100^\circ$ . Find the angle.

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## Worked answers | Lesson 060

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**01** Find the arc length in a radius-6 circle subtended by angle  $2\pi/3$  radians.

$$s = r\theta = 6(2\pi/3) = 4\pi.$$

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**02** Find the area of that sector.

$$A = r^2\theta/2 = 36(2\pi/3)/2 = 12\pi \text{ square units.}$$

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**03** A wheel turns 30 revolutions per minute. Find angular speed in radians per second.

$$30(2\pi)/60 = \pi \text{ rad/s.}$$

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**04** A radius-0.4-m wheel rotates at 5 rad/s. Find its rim's linear speed.

$$v = r\omega = 0.4(5) = 2 \text{ m/s.}$$

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Practice focus: Circles, chords and equations

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**05** Write the circle with center (2, -3) and radius 5.

$$(x - 2)^2 + (y + 3)^2 = 25.$$

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**06** Find the center and radius of  $x^2 + y^2 - 6x + 4y - 12 = 0$ .

Complete squares:  $(x - 3)^2 + (y + 2)^2 = 25$ . Center (3, -2), radius 5.

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**07** A chord of a radius-5 circle is 3 units from the center. Find its length.

The perpendicular from center bisects the chord. Half-chord =  $\sqrt{(25 - 9)} = 4$ ; whole chord 8.

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**08** An inscribed angle intercepts an arc measuring  $100^\circ$ . Find the angle.

An inscribed angle is half its intercepted arc:  $50^\circ$ .