

Watch. Practice. Understand. | Lesson 351

Conic Sections and Geometry Formulas Students Need To Know For Taking ACT math

Watch the matching video: <https://www.youtube.com/watch?v=vcsgB-qsu74>

Practice focus: Circles, chords and equations

Related course review; confirm topics with your teacher.

Name: _____ Date: _____ Show your reasoning and check units.

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

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

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

04 An inscribed angle intercepts an arc measuring 100° . Find the angle.

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Conic Sections and Geometry Formulas Students Need To Know For Taking ACT math

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Practice focus: Conic sections

Related course review; confirm topics with your teacher.

Name: _____ Date: _____ Show your reasoning and check units.

05 Find center, vertices and foci of $x^2/25 + y^2/9 = 1$.

06 Find the vertices and asymptotes of $x^2/9 - y^2/16 = 1$.

07 For $y^2 = 8x$, find vertex, focus and directrix.

08 Classify $x^2 + 4y^2 = 16$ and $x^2 - y^2 = 9$.

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Practice focus: Area and perimeter

Related course review; confirm topics with your teacher.

Name: _____ Date: _____ Show your reasoning and check units.

09 Find the area of a triangle with base 14 and perpendicular height 9.

10 A regular polygon has perimeter 40 and apothem 6. Find its area.

11 Use Heron's formula for a triangle with sides 5, 5 and 6.

12 Use Brahmagupta's formula for a cyclic quadrilateral with sides 3, 4, 3, 4.

Worked answers | Lesson 351

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Practice focus: Circles, chords and equations

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

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

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- 02** 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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- 03** 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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- 04** An inscribed angle intercepts an arc measuring 100° . Find the angle.

An inscribed angle is half its intercepted arc: 50° .

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Practice focus: Conic sections

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05 Find center, vertices and foci of $x^2/25 + y^2/9 = 1$.

Center (0,0); vertices $(\pm 5, 0)$; $c^2 = 25 - 9 = 16$, so foci $(\pm 4, 0)$.

06 Find the vertices and asymptotes of $x^2/9 - y^2/16 = 1$.

Vertices $(\pm 3, 0)$; asymptotes $y = \pm(4/3)x$.

07 For $y^2 = 8x$, find vertex, focus and directrix.

$4p = 8$, so $p = 2$. Vertex (0,0), focus (2,0), directrix $x = -2$.

08 Classify $x^2 + 4y^2 = 16$ and $x^2 - y^2 = 9$.

The first has two positive squared terms with unequal coefficients: ellipse. The second has opposite signs: hyperbola.

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Practice focus: Area and perimeter

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09 Find the area of a triangle with base 14 and perpendicular height 9.

$$A = bh/2 = 14(9)/2 = 63 \text{ square units.}$$

10 A regular polygon has perimeter 40 and apothem 6. Find its area.

$$A = ap/2 = 6(40)/2 = 120 \text{ square units.}$$

11 Use Heron's formula for a triangle with sides 5, 5 and 6.

$$\text{Semiperimeter } s = 8. A = \sqrt{(8 \cdot 3 \cdot 3 \cdot 2)} = 12 \text{ square units.}$$

12 Use Brahmagupta's formula for a cyclic quadrilateral with sides 3, 4, 3, 4.

$$s = 7. A = \sqrt{((7-3)(7-4)(7-3)(7-4))} = 12. \text{ The cyclic condition is necessary.}$$