

For 1-5: Rewrite each circle in standard form by completing the square. State the center and radius and graph.

<p>1) <math>x^2 + y^2 + 2x + 10y + 10 = 0</math></p> <p><math>x^2 + 2x + \underline{\hspace{2cm}} + y^2 + 10y + \underline{\hspace{2cm}} = -10 + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}</math></p>	
<p>2) <math>x^2 + y^2 + 4x - 8y + 11 = 0</math></p>	
<p>3) <math>x^2 + y^2 - 6x + 5 = 0</math></p>	
<p>4) <math>x^2 + y^2 + 8y + 15 = 0</math></p>	<p>5) <math>x^2 + y^2 = \frac{9}{4}</math></p>
<p>6) In the <math>xy</math>-plane, the graph of the equation below is a circle. Point <math>P</math> is on the circle and has coordinates <math>(10, -5)</math>. If <math>\overline{PQ}</math> is a diameter of the circle, what are the coordinates of point <math>Q</math> ?</p> <p>A) <math>(2, -5)</math>      <math>(x - 6)^2 + (y + 5)^2 = 16</math>          B) <math>(6, -1)</math>          C) <math>(6, -5)</math>          D) <math>(6, -9)</math></p>	<p>7) A circle in the standard <math>(x,y)</math> coordinate plane has center <math>C(-1,2)</math> and passes through <math>A(2,6)</math>. Line segment <math>\overline{AB}</math> is a diameter of this circle. What are the coordinates of point <math>B</math> ?</p> <p><b>F.</b> <math>(-6, -2)</math>  <b>G.</b> <math>(-5, -1)</math>  <b>H.</b> <math>(-4, -2)</math>  <b>J.</b> <math>(4, 2)</math>  <b>K.</b> <math>(5, 10)</math></p>
<p>8) <math>x^2 + y^2 + 4x - 2y = -1</math></p> <p>The equation of a circle in the <math>xy</math>-plane is shown above. What is the radius of the circle?</p> <p>A) 2          B) 3          C) 4          D) 9</p>	<p>9) <math>x^2 + 20x + y^2 + 16y = -20</math></p> <p>The equation above defines a circle in the <math>xy</math>-plane. What are the coordinates of the center of the circle?</p> <p>A) <math>(-20, -16)</math>    C) <math>(10, 8)</math>          B) <math>(-10, -8)</math>    D) <math>(20, 16)</math></p>

Solve the system by substitution and label the solutions on the graph.

<p>10) <math>\begin{cases} x^2 + y^2 = 13 \\ y = 3 \end{cases}</math></p>	<p>11) <math>\begin{cases} x^2 + y^2 = 45 \\ x = 2y \end{cases}</math></p>
<p>Challenge: Find the equation of the line tangent to the circle at point A.</p>	

Optional Challenge: (check on Desmos) (A)  $\begin{cases} x^2 + y^2 = 34 \\ y = x + 2 \end{cases}$  (B)  $\begin{cases} x^2 + y^2 + 2x + 4y = 20 \\ y = x - 2 \end{cases}$

Find the indicated value.

<p>1)</p>	<p>2)</p>	<p>3)</p>	<p>4)</p>
<p>5)</p>	<p>6)</p>	<p>7)</p>	<p>8) tangent to O</p>

Answers: 7, 13, 20, 26, 30, 40, 42, 43, 47.5, 54, 64, 67, 80, 84, 85, 90, 96, 101

Algebra Review: Simplify each expression:

<p>9) <math>\frac{x^2 - 16x + 64}{x^2 - 8x}</math></p>	<p>10) <math>\frac{x^2 - 36}{x^2 + 12x + 36}</math></p>	<p>11) <math>\frac{12x^2 + 6x}{8x + 4}</math></p>	<p>12) <math>\frac{8x^5 y^{-6}}{12x^{-3} y^2}</math></p>
<p>13) <math>\left(3 - \frac{5}{3}\right)^2</math></p>	<p>14) <math>\left(\frac{\sqrt{3}}{2}\right)^2 + \left(\frac{\sqrt{2}}{2}\right)^2</math></p>	<p>15) <math>4\left(\frac{\sqrt{3}}{2}\right) + 6\left(\frac{\sqrt{3}}{3}\right)</math></p>	<p>16) <math>2\sqrt{27} + 5\sqrt{12}</math></p>