

Directions: Show all work in order to receive full credit.

1. Determine the center and the radius of $x^2 + y^2 + 10x - 4y + 25 = 0$.

$$x^2 + 10x + y^2 - 4y = -25$$

$$x^2 + 10x + 25 + y^2 - 4y + 4 = -25 + 25 + 4$$

$$(x+5)^2 + (y-2)^2 = 4$$

Center $(-5, 2)$ radius = 2

2. Convert the following quadratic into vertex form: $y = x^2 + 6x + 7$.

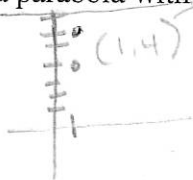
$$\left(\frac{6}{2}\right)^2 = 9$$

$$y = (x^2 + 6x + 9) + 7 - 9$$

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

Vertex $(-3, -2)$

3. Given a parabola with focus $(1, 4)$ and directrix $y = 7$, write the equation of the parabola in standard form.



Vertex $(1, 5.5)$

$$(x-h)^2 = 4p(y-k)$$

$$(x-1)^2 = 4(1.5)(y-5.5)$$

$$x^2 - 2x + 1 = 6(y - 5.5)$$

$$x^2 - 2x + 1 = 6y - 33$$

$$\frac{x^2 - 2x + 34}{6} = y$$

4. Factor the expression completely: $64x^8 - y^{12}$

$$(8x^4 - y^6)(8x^4 + y^6)$$

5. Solve $2x^2 + 8x + 12 = 0$ by completing the square and express the result in simplest $a + bi$ form.

$$x^2 + 4x + 6 = 0$$

$$x^2 + 4x = -6$$

$$x^2 + 4x + 4 = -6 + 4$$

$$(x+2)^2 = -2$$

$$x+2 = \pm \sqrt{-2}$$

$$x = -2 \pm i\sqrt{2}$$

6. Factor completely: $2x^3 - 6x^2 - x + 3$

$$2x^2(x-3) - 1(x-3)$$

$$(2x^2 - 1)(x - 3)$$

EXTRA REVIEW
Quiz 2.2

Directions: Show all work in order to receive full credit.

1. Write the quadratic equation that has as its roots $7 + 2i$ and $7 - 2i$

$$S = 14 = \frac{-b}{a}$$

$$P = 53 = \frac{c}{a}$$

$$a = 1$$

$$b = -14$$

$$c = 53$$

$$x^2 - 14x + 53 = 0$$

2. Solve algebraically for all real and imaginary values of x in simplest form.

$$x^4 + 4x^3 + 4x^2 + 16x = 0$$

$$x^3(x+4) + 4x(x+4) = 0$$

$$(x^3 + 4x)(x+4) = 0$$

$$x(x^2 + 4)(x+4) = 0$$

$x = 0$	$x = \pm 2i$	$x = -4$
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$$\{0, \pm 2i, -4\}$$

3. Find the sum and product of the roots of the equation $7x^2 - 10x + 1 = 0$

$$S = \frac{-b}{a} = \frac{10}{7}$$

$$P = \frac{c}{a} = \frac{1}{7}$$

4. Find all values of k such that the equation $5x^2 - 3x + k = 0$ has imaginary roots.

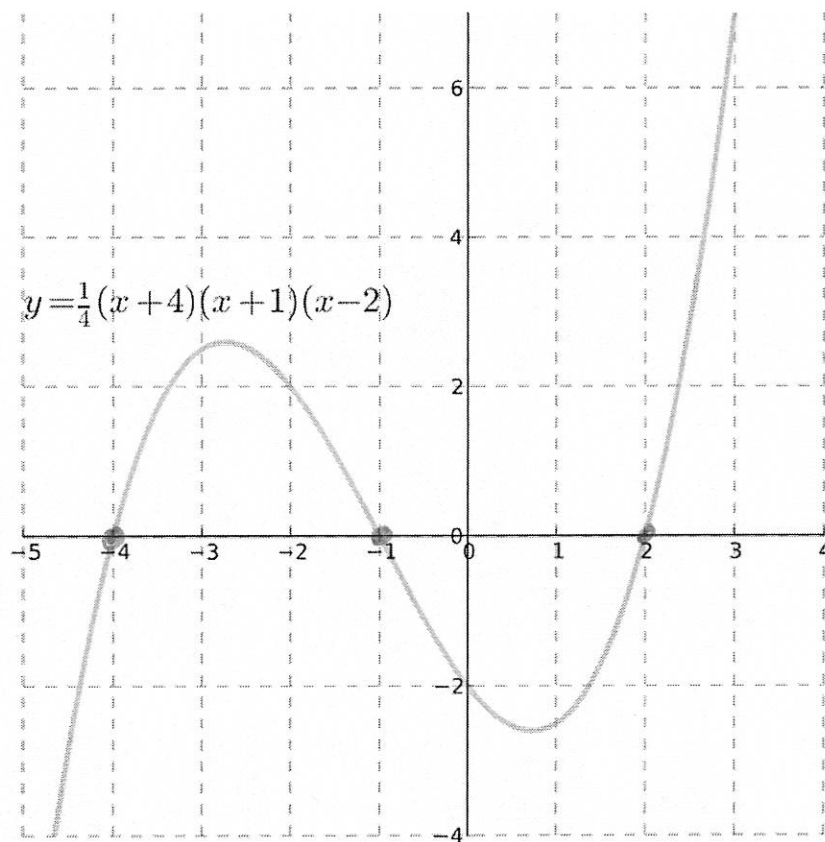
$$b^2 - 4ac < 0$$

$$9 - 20k < 0$$

$$9 < 20k$$

$$\frac{9}{20} < k$$

5. Given the graph shown below, state the solution set.



$$\{x = -4, -1, 2\}$$

EXTRA REVIEW
Quiz 3.1

Key

Directions: Show all work in order to receive full credit.

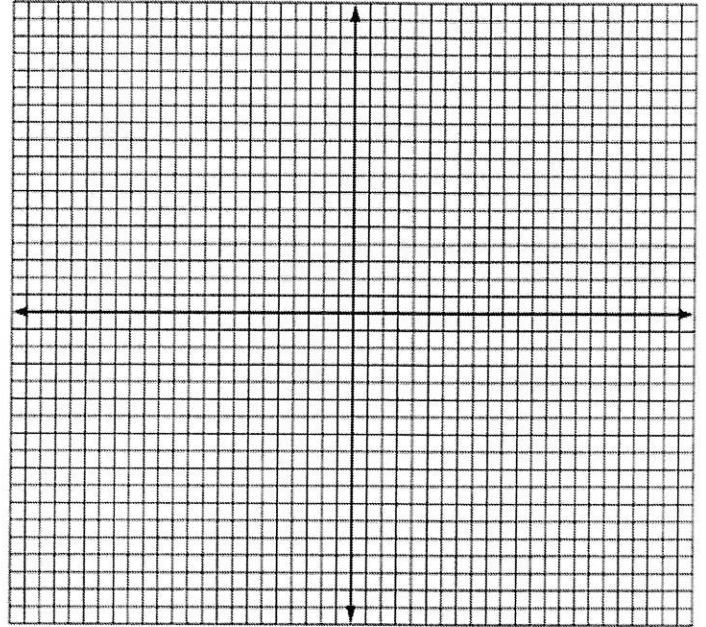
1. What is the solution set of the quadratic inequality $3x^2 - 8x + 4 > 0$

[Use of the grid below is optional]

$$\begin{aligned} & 3x^2 - 8x + 4 \\ & x^2 - 8x + 12 \\ & (x - \frac{2}{3})(x - 6) \\ & (3x - 2)(x - 2) \\ & x = \frac{2}{3} \quad x = 2 \end{aligned}$$



$$\left\{ x < \frac{2}{3} \text{ OR } x > 2 \right\}$$



2. What is the solution set to the system of equations below:

[Use of the grid below is optional]

$$\begin{aligned} y &= x^2 - x - 6 \\ 2 &= 2x - y \end{aligned}$$

$$\begin{aligned} 2 &= 2x - (x^2 - x - 6) \\ 2 &= 2x - x^2 + x + 6 \end{aligned}$$

$$x^2 - 3x - 4 = 0$$

$$(x - 4)(x + 1) = 0$$

$$x = 4 \quad x = -1$$

$$y = 4^2 - 4 - 6$$

$$y = 16 - 10$$

$$y = 6$$

$$(4, 6)$$

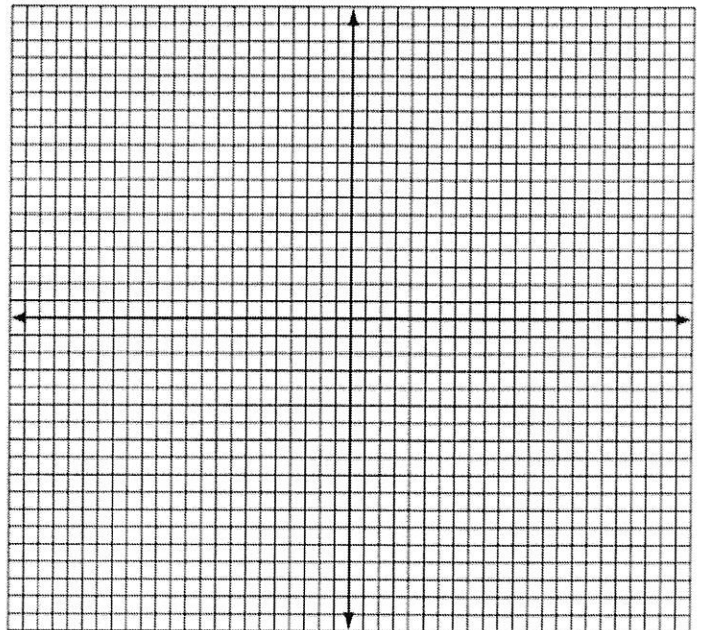
$$y = (-1)^2 - (-1) - 6$$

$$y = 1 + 1 - 6$$

$$y = -4$$

$$(-1, -4)$$

$$\{(-1, -4), (4, 6)\}$$



EXTRA REVIEW
Quiz 4.1

Key

Directions: Show all work in order to receive full credit.

1. Simplify the rational expression below using BOTH using *long division and synthetic division*:

$$\frac{3x^3 + 4x - 1}{x - 2}$$

LD:

$$\begin{array}{r} x-2 \overline{) 3x^3 + 4x - 1} \\ \underline{-(3x^3 - 6x^2)} \\ 6x^2 + 4x \\ \underline{-(6x^2 - 12x)} \\ 16x - 1 \\ \underline{-(16x - 32)} \\ 31 \end{array}$$

SD:

$$\begin{array}{r} 2 \overline{) 3 } \\ \underline{ 6 } \\ 3 \\ \underline{ } \\ 31 \end{array}$$
$$3x^2 + 6x + 16 + \frac{31}{x-2}$$

2. Express in simplest form:

$$\frac{x^2 - 9}{x^2 + 3x - 10} \div \frac{3 - x}{4x + 16} \cdot \frac{3x - 6}{x^2 + 7x + 12}$$

$$\frac{(x+3)(x-3)}{(x+5)(x-2)} \cdot \frac{4(x+4)}{-1(x-3)} \cdot \frac{3(x-2)}{(x+3)(x+4)}$$

$$\frac{-12}{x+5}$$