Math 3 Name _____

Polynomial and Rational Function Date _____

Lesson 2 Practice Quiz

1. Consider the quadratic function $f(x) = x^2 + 6x + 2$. Complete each task by algebraic reasoning alone. Show all of your work to support your answer.

   a. Rewrite the function in vertex form.

   b. Does the graph of this function have a maximum or minimum? Determine the coordinates of the maximum or minimum point of the graph of this function.

   c. What are the coordinates of the x-intercepts of the graph of this function?

   d. What are the coordinates of the y-intercept of the graph of this function?

2. Rewrite each quadratic in vertex form and give the vertex.

a. $y = x^2 - 6x - 11$ b. $y = x^2 - x - 3$ c. $y = x^2 + 12x - 10$

3. Use the quadratic formula, factoring, or complete the square to solve each of these quadratics. Identify each solution as rational, irrational, or complex. Write non-real complex solutions in standard from $a + bi$. Must use each method once.

a. $2x^2 + 3x - 5 = 0$ b. $2x^2 + x - 3 = 0$ c. $3x^2 + x + 10 = 0$

d. $x^2 + 5x + 10 = 0$ e. $3x^2 + 2x + 1 = 0$ f. $x^2 - 5x = -5$

g. $4x(x+5)+29=0$

h. $9x^2-6x+2=0$

4. Write $y=(x-4)(x+9)$ in standard from.

5. Write $y=-2(x+5)^2+2$ in standard from.

6. Write $y=2(x-2)^2-2$ in intercept form.

7. Preform the indicated operation and write you answer in standard form.

a. $(3+4i)+(5-6i)$

b. $(7-3i)-(4+2i)$

b. $(5-6i)+5i+(7+6i)$

d. $(-1+i)-(-7+4i)-5$

e. $2i(7+2i)$

f. $(5-4i)(2+3i)$

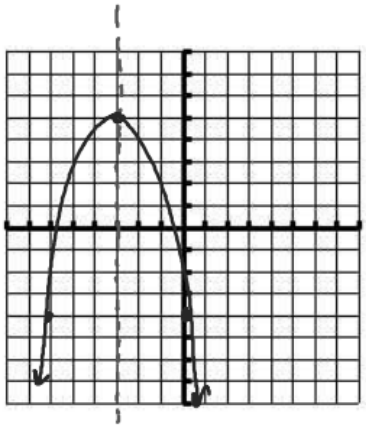
g. $(-2+4i)^2$

Graph the following equation. $y = a(x-h)^2+k$

$y = -(x+3)^2 + 5$

Vertex (-3, 5) Axis of Symmetry X = -3

Maximum or Minimum? y – intercept (0, -4)



$y = -(0+3)^2 + 5$

$-(3)^2 + 5$

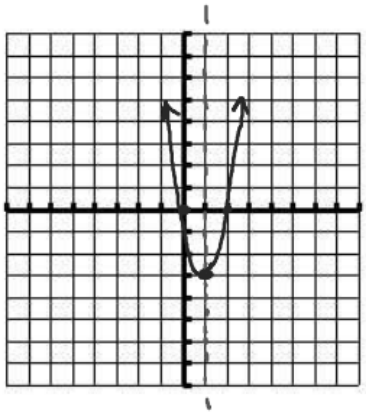
$-9 + 5$

-4

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

Vertex (1, -3) Axis of Symmetry X = 1

Maximum or Minimum? y – intercept (0, 0)



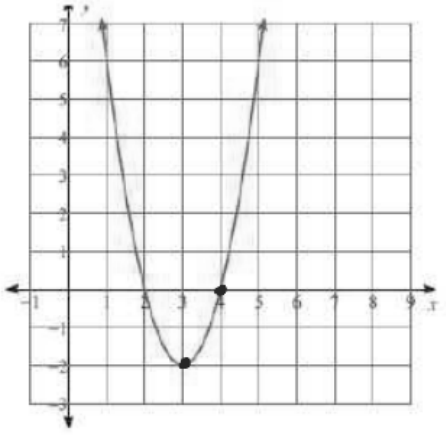
$y = 3(0-1)^2 - 3$

$3(-1)^2 - 3$

$3 - 3$

0

Write the equation for the parabola.



h k
V (3, −2)

x y
(4, 0)

$y = a(x-h)^2 + k$

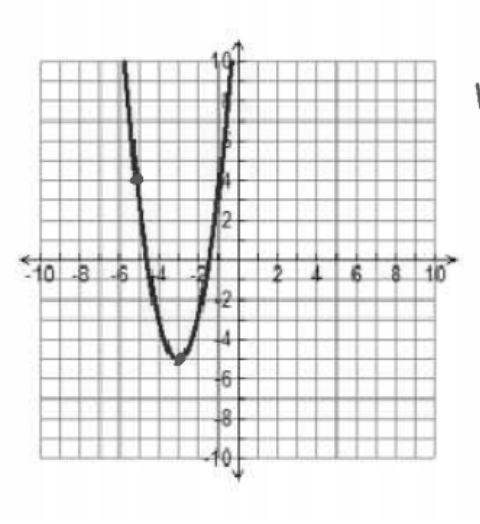
$0 = a(4-3)^2 - 2$

$0 = a(1)^2 - 2$

$0 = a - 2$

$a = 2$

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



V (−3, −5) (−5, 4)

$y = a(x-h)^2 + k$

$4 = a(-5+3)^2 - 5$

$4 = a(-2)^2 - 5$

$4 = 4a - 5$

$9 = 4a$

$a = \frac{9}{4}$

$y = \frac{9}{4}(x+3)^2 - 5$