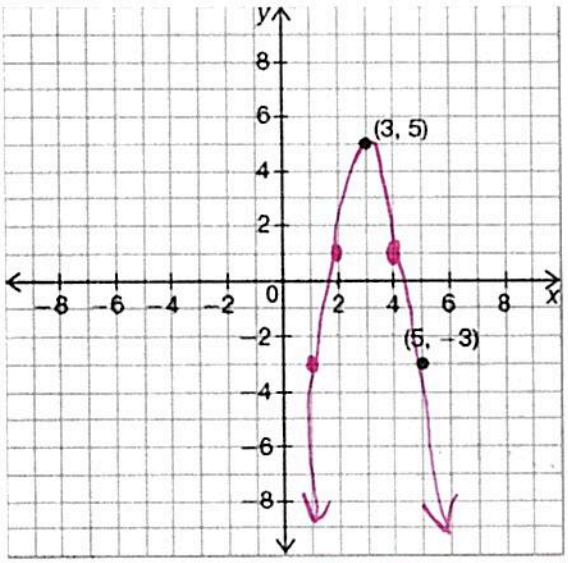
PAP Algebra 2

Sec. 3.5 Skills Practice

Name: Key

Use your knowledge of reference points to <u>write an equation</u> for the quadratic function that satisfies the given information. Use the graph to help solve each problem.

1. Given: vertex (3, 5) and point (5, – 3)



$y = a(x-3)+5$

$-3 = a(5-3)+5$

$-3 = 2a+5$

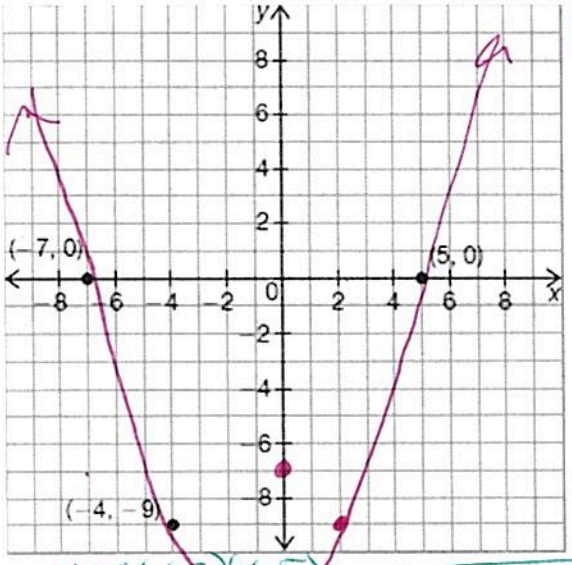
$-5 \quad -5$

$-8 = 2a$

$a = -4$

$y = -4(x-3)+5$

2. Given: two *x*-intercepts (–7, 0) and (5, 0) and one point (–4, – 9)



$y = a(x+7)(x$

$y = a(x+7)(x-5)$

$-9 = a(-4+7)(-4-5)$

$-9 = a(3)(-9)$

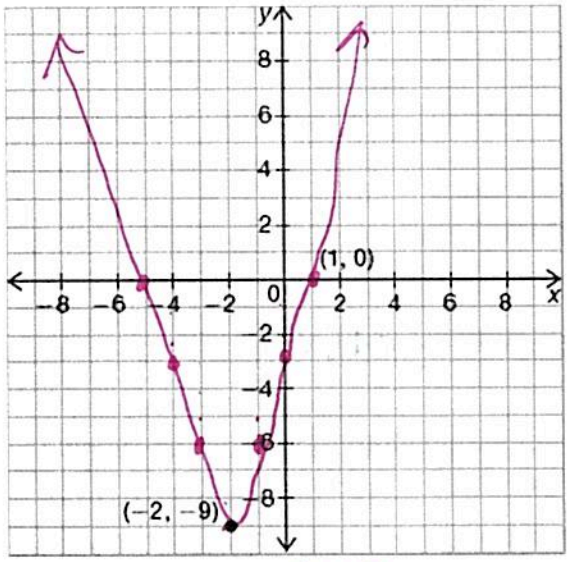
$-9 = -27a$

$-27 \quad -27$

$a = 1/3$

$y = 1/3(x+7)(x-5)$

3. Given: vertex (–2, – 9) and one of two *x*-intercepts (1, 0)



$y = a(x+2)-9$

$0 = a(1+2)-9$

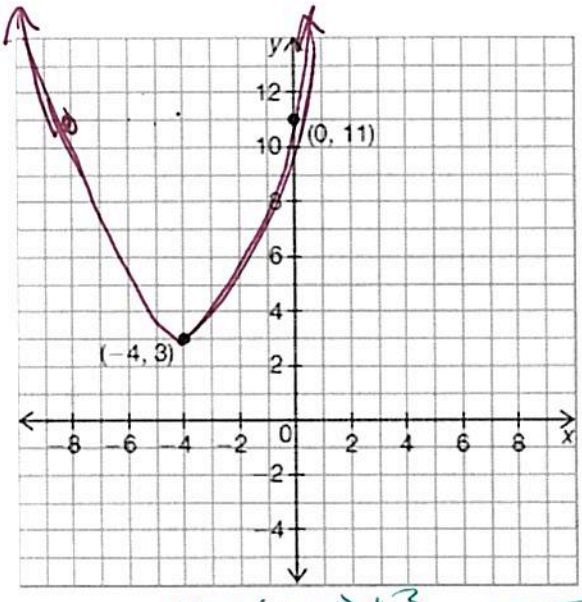
$0 = 3a-9$

$9 = 3a$

$a = 3$

$y = 3(x+2)-9$

4. Given: vertex (–4, 3) and *y*-intercept (0, 11)



$y = a(x+4)+3$

$11 = a(0+4)+3$

$11 = 4a+3$

$-3 \quad -3$

$8 = 4a$

$a = 2$

$y = 2(x+4)+3$

$y = ax^2 + bx + c$

5. Create a system of equations and use algebra to create a quadratic equation with points (-2, 3), (2, -9), and (0, 5).

$3 = a(-2)^2 + b(-2) + c \rightarrow 3 = 4a - 2b + c \rightarrow 3 = 4a - 2b + 5 \rightarrow -2 = 4a - 2b$

$-9 = a(2)^2 + b(2) + c \rightarrow -9 = 4a + 2b + c \rightarrow -9 = 4a + 2b + 5 \rightarrow -14 = 4a + 2b$

$-16 = 8a$

$a = -2$

$5 = a(0)^2 + b(0) + c \rightarrow \boxed{5 = c}$

$\boxed{y = -2x^2 - 3x + 5}$

$-2 = 4(-2) - 2b$

$-2 = -8 - 2b$

$+8 \quad +8$

$6 = -2b \quad \boxed{b = -3}$

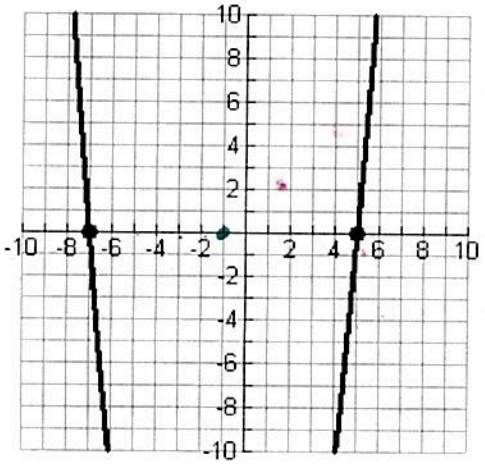
6. Write the equation of a quadratic, in both factored and standard form, with solutions at -3 and $\frac{4}{3}$.

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

$3x^2 - 4x + 9x - 12 = 0$

$\boxed{y = 3x^2 + 5x - 12}$ $\boxed{y = (x+3)(3x-4)}$

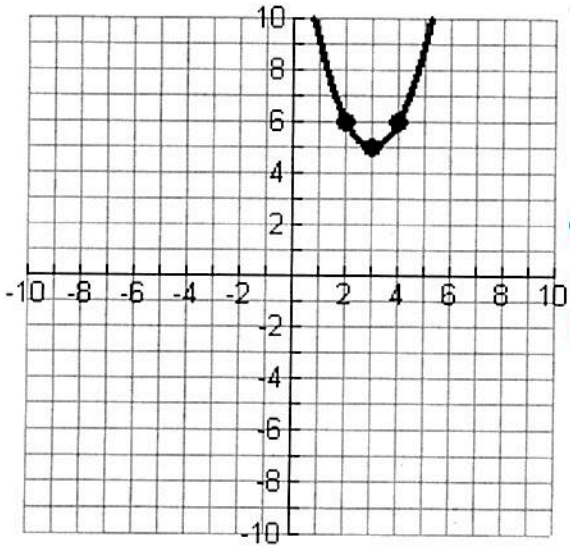
7. Write the equation of a quadratic, in factored form, given the following graph, $a = 1$



$y = a(x+7)(x-5)$

$\boxed{y = 1(x+7)(x-5)}$

8. Write the equation of the quadratic in the graph shown below.



A. Standard form: $y = x^2 - 6x + 14$

B. Vertex form: $y = 1(x-3)^2 + 5$

$(x-3)(x-3)+5$

$x^2 - 3x - 3x + 9 + 5$

$x^2 - 6x + 14$

C. Why can't you write factored form using real numbers?

They Don't Cross the X-Axis!

PAP Algebra 2
Sec. 3.6 Skills Practice

Name: MS. Delgado

Rewrite each expression using *i*.

1. $\frac{\sqrt{-48}-12}{4}$ $= \frac{4i\sqrt{3}-12}{4}$

$i\sqrt{48}$ $= \frac{4i\sqrt{3}}{4} - \frac{12}{4}$

$4 \cdot 12$ $= -3 + i\sqrt{3}$

$2 \cdot 2 \cdot 4 \cdot 3$

$2 \cdot 2$

2. $38 - \sqrt{-200} + \sqrt{121} = 38 - 10i\sqrt{2} + 11$

$i\sqrt{200}$ $= 49 - 10i\sqrt{2}$

$10 \cdot 20$

$5 \cdot 2 \cdot 5 \cdot 4$

$2 \cdot 2$

Simplify each expression.

3. $22i + 13 - (7i + 3 + 12i) + 16i - 25$

$22i + 13 - 7i - 3 - 12i + 16i - 25$

$-15 + 19i$

$-33 + 19i$

4. $-0.5(14i - 6) - 4i(0.75 - 3i)$

$-7i + 3 - 3i + 12i^2$

$-7i + 3 - 3i - 12$

$-9 - 10i$

5. $(4 - 5i)(8 + i)$

$32 + 4i - 40i - 5i^2$

$32 + 4i - 40i + 5$

$37 - 36i$

6. $(3 + 2i)(3 - 2i)(1 + 4i)$

conjugates

$a^2 + b^2 = (3)^2 + (2)^2 = 13$

$13(1 + 4i)$

$13 + 52i$

7. $(1 - i)(1 + i)(2 + 5i)$

conjugate

$(1)^2 + (1)^2 = 2$

$2(2 + 5i)$

$4 + 10i$

Rewrite each quotient.

8. $\frac{3+4i}{5+6i} \cdot \frac{5-6i}{5-6i} = \frac{39+2i}{61}$

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

$15 - 18i + 20i - 24i^2$

$15 - 18i + 20i + 24$

$39 + 2i$

$a^2 + b^2 = (5)^2 + (6)^2$

$= 25 + 36 = 61$

9. $\frac{-6+2i}{2-3i} \cdot \frac{2+3i}{2+3i} = \frac{-18-14i}{13}$

$(-6 + 2i)(2 + 3i)$

$-12 - 18i + 4i + 6i^2$

$-12 - 18i + 4i - 6$

$-18 - 14i$

$(2)^2 + (3)^2 = 13$