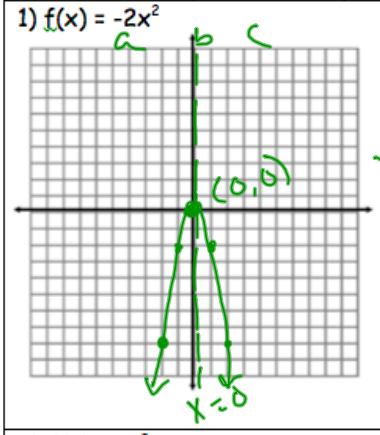
5.2 Practice Problems

Directions: Graph. Label the y-intercept, vertex and axis of symmetry. Graph with a table or using 1-3-5 shortcut.

1) $f(x) = -2x^2$



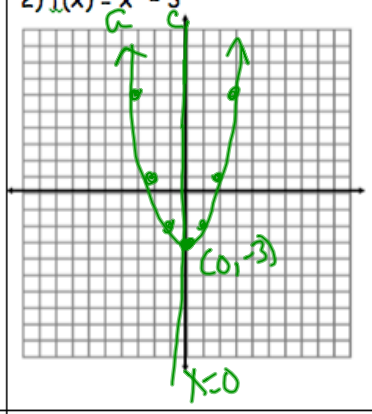
$\frac{-0}{2(-2)} = 0$

$x = 0$

$y = -2(0)^2$

$= 0$

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

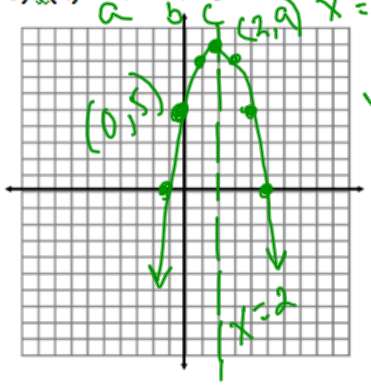


$\frac{-0}{2(1)} = 0$

$y = 0^2 - 3$

$y = -3$

3) $f(x) = -x^2 + 4x + 5$



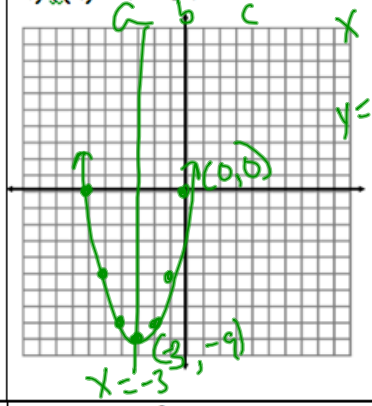
$x = \frac{-4}{2(-1)} = 2$

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

$= -4 + 8 + 5$

$= 9$

4) $f(x) = x^2 + 6x$



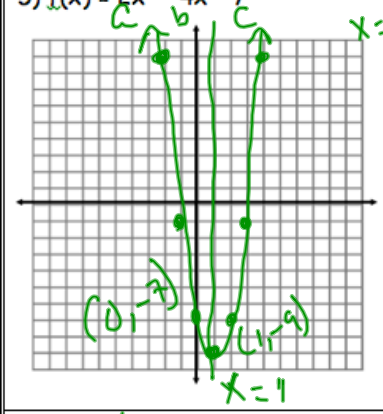
$x = \frac{-6}{2(1)} = -3$

$y = (-3)^2 + 6(-3)$

$9 - 18$

$y = -9$

5) $f(x) = 2x^2 - 4x - 7$



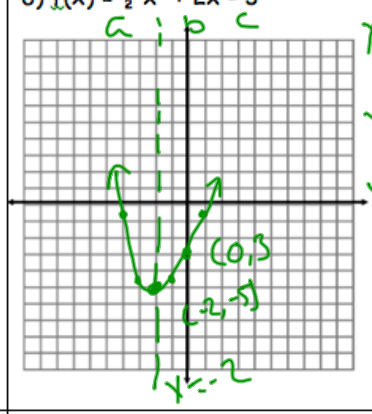
$x = \frac{4}{2(2)} = 1$

$y = 2(1)^2 - 4(1) - 7$

$= 2 - 4 - 7$

$= -9$

6) $f(x) = \frac{1}{2}x^2 + 2x - 3$



$x = \frac{-2}{\frac{1}{2}(2)} = \frac{-2}{1} = -2$

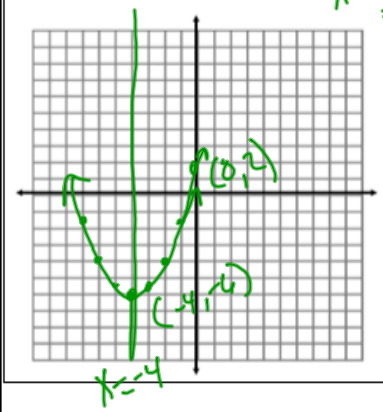
$y = \frac{1}{2}(-2)^2 + 2(-2) - 3$

$y = \frac{1}{2}(4) + -4 - 3$

$= 2 + -4 - 3$

$= -5$

7) $f(x) = \frac{1}{2}x^2 + 4x + 2$



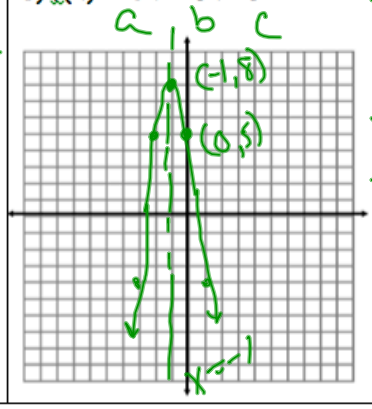
$x = \frac{-4}{\frac{1}{2}(1)} = -4$

$y = \frac{1}{2}(-4)^2 + 4(-4) + 2$

$= 8 - 16 + 2$

$= -6$

8) $f(x) = -3x^2 - 6x + 5$



$x = \frac{6}{2(-3)} = \frac{6}{-6} = -1$

$y = -3(-1)^2 - 6(-1) + 5$

$y = -3(1) + 6 + 5$

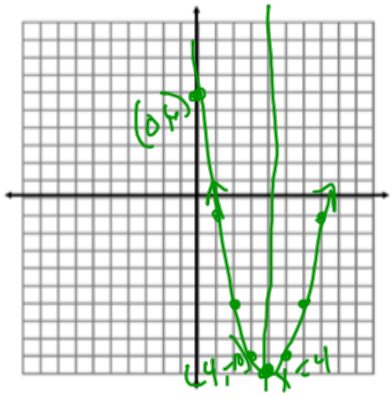
$y = -3 + 11$

$y = 8$

9) $f(x) = x^2 - 8x + 6$

a b c

$\frac{-(-8)}{2(1)} = \frac{8}{2} = 4$



$(4)^2 - 8(4) + 6$

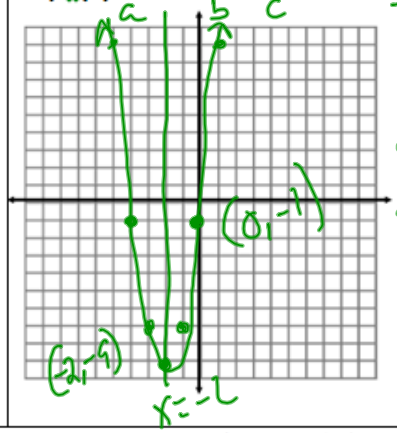
$16 - 32 + 6$

-16

10) $f(x) = 2x^2 + 8x - 1$

a b c

$\frac{-8}{2(2)} = \frac{-8}{4} = -2$



$2(-2)^2 + 8(-2) - 1$

$2(4) + -16 - 1$

$8 - 17$

-9

Directions: Tell whether each function has a minimum value or a maximum value. Find the minimum or maximum value.

11) $y = -6x^2 - 1$

$\frac{0}{-12} = 0$

$-6(0)^2 - 1$

-1

maximum value of -1

12) $f(x) = 2x^2 + 8x + 7$

$x = \frac{-8}{2(2)} = \frac{-8}{4} = -2$

$2(-2)^2 + 8(-2) + 7$

$2(4) + -16 + 7$

$8 + -16 + 7$

-1

minimum value of -1

13) $y = -3x^2 + 18x - 5$

$x = \frac{-18}{-3(2)} = \frac{-18}{-6} = 3$

$-3(3)^2 + 18(3) - 5$

$-27 + 54 - 5$

22

maximum value of 22

Directions: Put the quadratic equation in standard form.

14) $f(x) = -2(x - 1)^2 - 4$

$-2(x-1)(x-1) - 4$

$-2(x^2 - x - x + 1) - 4$

$-2(x^2 - 2x + 1) - 4$

$-2x^2 + 4x - 2 - 4$

$f(x) = -2x^2 + 4x - 6$

15) $f(x) = (x - 3)^2 + 2$

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

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

$= x^2 - 6x + 11$

16) $(x - 4)^2 - 5$

$(x-4)(x-4) - 5$

$x^2 - 8x + 16 - 5$

$f(x) = x^2 - 8x + 11$