

HW: Worksheet/8-28 even (omit 22)

Warm up:

Graph.

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

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

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

$$-4 + 8 + 5 = 9$$

$$f(-1) = 8$$

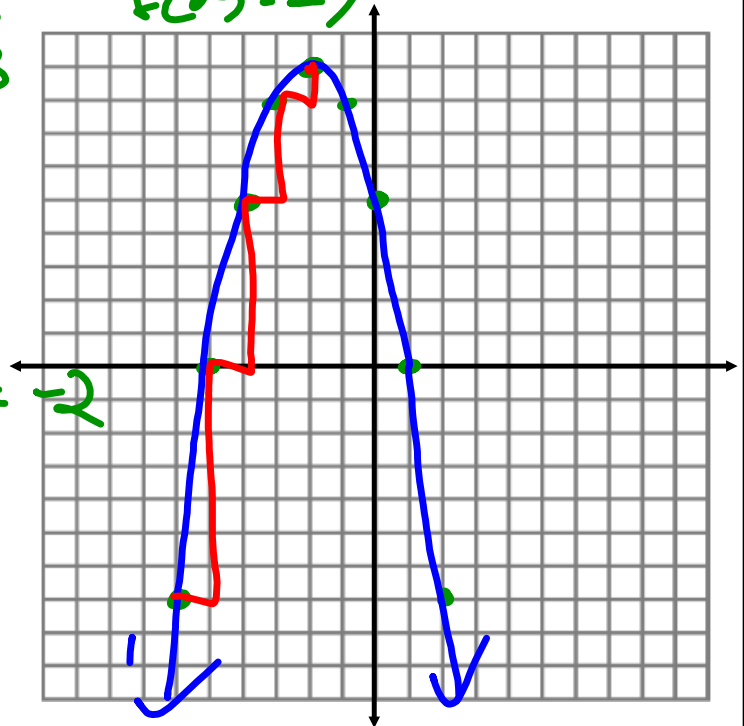
$$f(0) = 5$$

$$f(-3) = 8$$

$$f(0) = 5$$

$$f(-4) = 5$$

$$f(-5) = 0 \quad f(1) = 0$$



HW Solutions

$$a(x) = 3x^2 - 12x + 1 \quad -\frac{b}{2a}$$

$$-\frac{-12}{2(3)} = -\frac{-12}{6} = -(-2) = 2$$

$$a(2) = 3(2)^2 - 12(2) + 1$$

$$12 - 24 + 1$$

$$-12 + 1$$

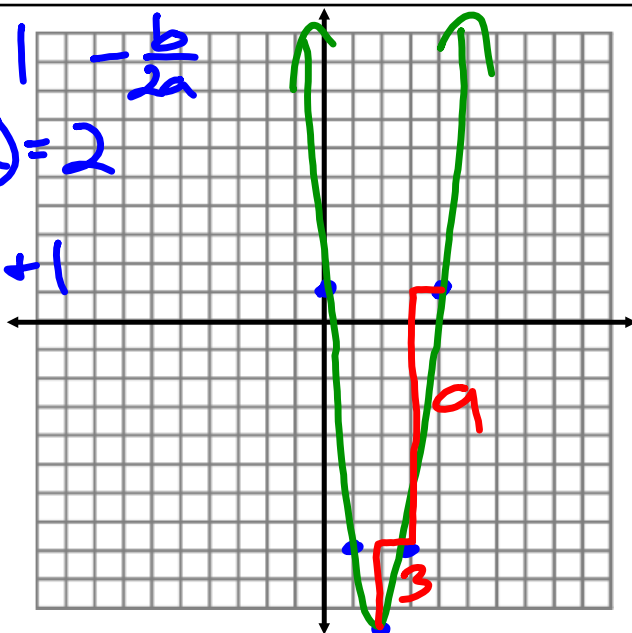
$$-11$$

$$a(1) = -8$$

$$a(3) = -8$$

$$a(0) = 1$$

$$a(4) = 1$$



$$1 \times 3 = 3$$

$$3 \times 3 = 9$$

$$5 \times 3 = 15$$

$$3, 9, (15)$$

How do we know if a parabola is facing upwards or downwards?

$a > 0$ up

$a < 0$ down

Graph the following on [desmos.com/calculator](https://www.desmos.com/calculator)

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

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

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

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

What do you notice?

Tell whether the following functions are facing upwards or downwards and if it should be steep, not very steep, or neither. ~~Use your calculators to check your answers.~~

1) $f(x) = -2x^2 + 1$ down neither

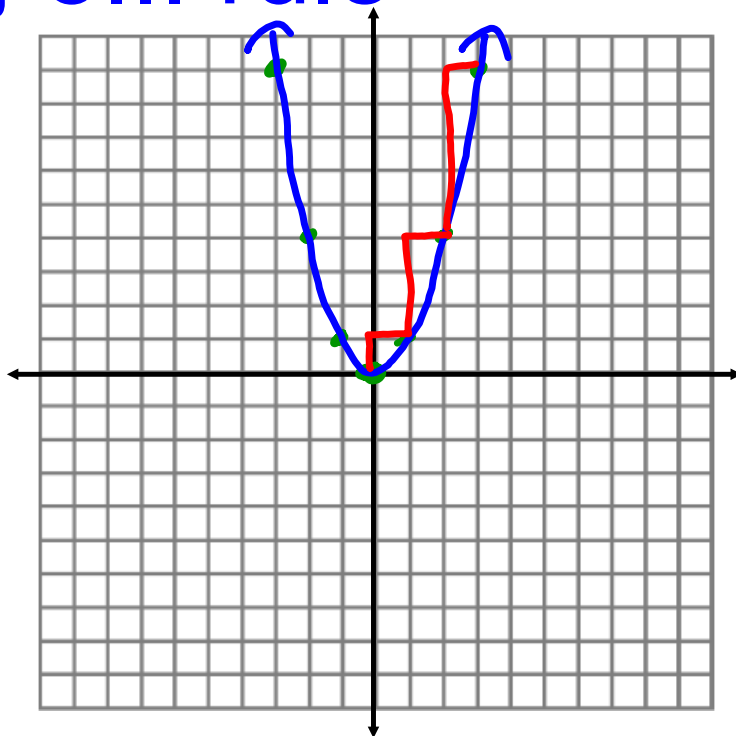
2) $g(x) = 8 - x^2$ down neither

3) $t(x) = (1/4)x^2 - 17$ up not steep

4) $r(x) = -4 + 9x^2$ up steep

1, 3, 5... rule

$$y = x^2$$



$$y = \underline{2}x^2$$

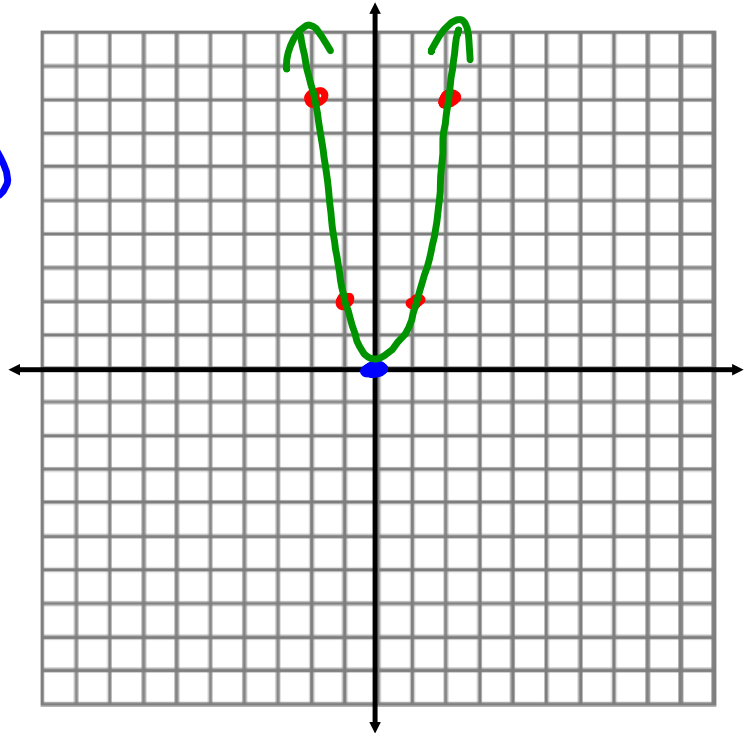
$$-\frac{0}{2(2)} = 0 \quad (0, 0)$$

$$2(0)^2 = 0$$

$$1, 3, 5, \dots$$

$+2, +2, +2, \dots$

$$2, 6, 10, \dots$$



$$y = -2x^2 + 8x - 5$$

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

$$-2(2)^2 + 8(2) - 5$$

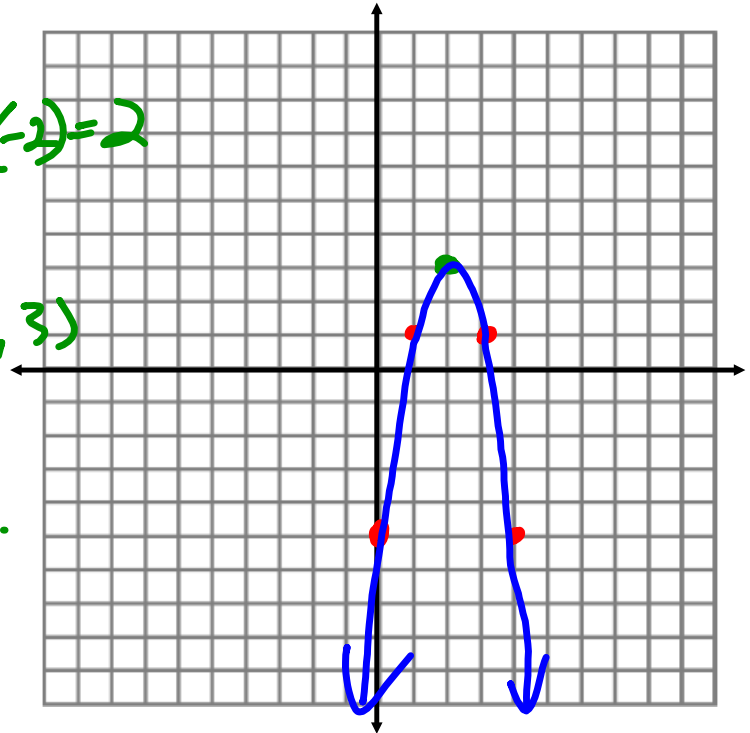
$$-8 + 16 - 5 \quad (2, 3)$$

$$\quad \quad \quad \begin{array}{r} 8 \\ -5 \\ \hline 3 \end{array}$$

1, 3, 5, ...

$\times 2 \times 2 \times 2$

2, 6, 10, ...



Graph the following functions. Check your answers in your graphing calculators.

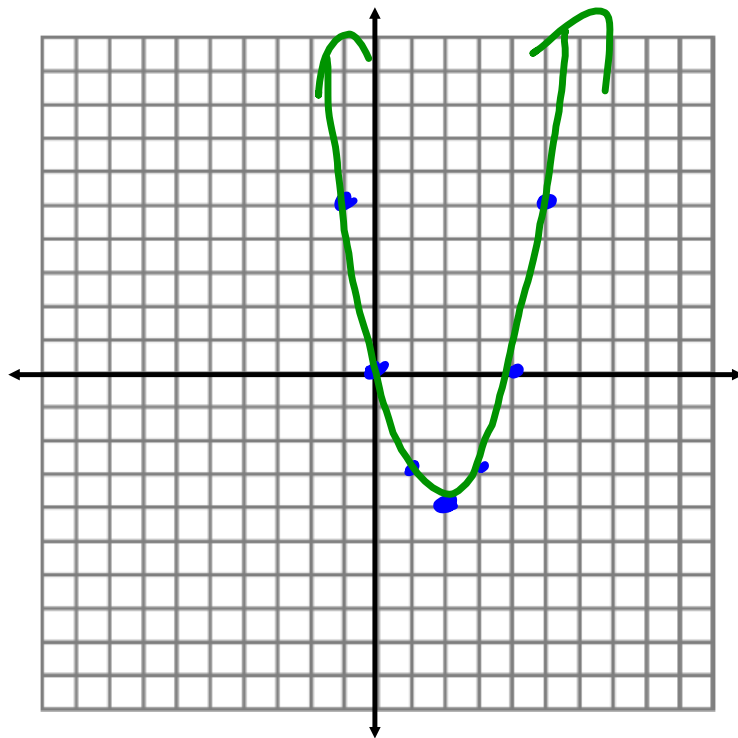
1) $f(x) = x^2 - 4x$ $-\frac{-4}{2(1)} = -\frac{-4}{2} = 2$ $f(2) = -4$

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

3) $Z(x) = 4 - (1/3)x^2$

4) $a(x) = x^2 - 6x + 8$

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



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

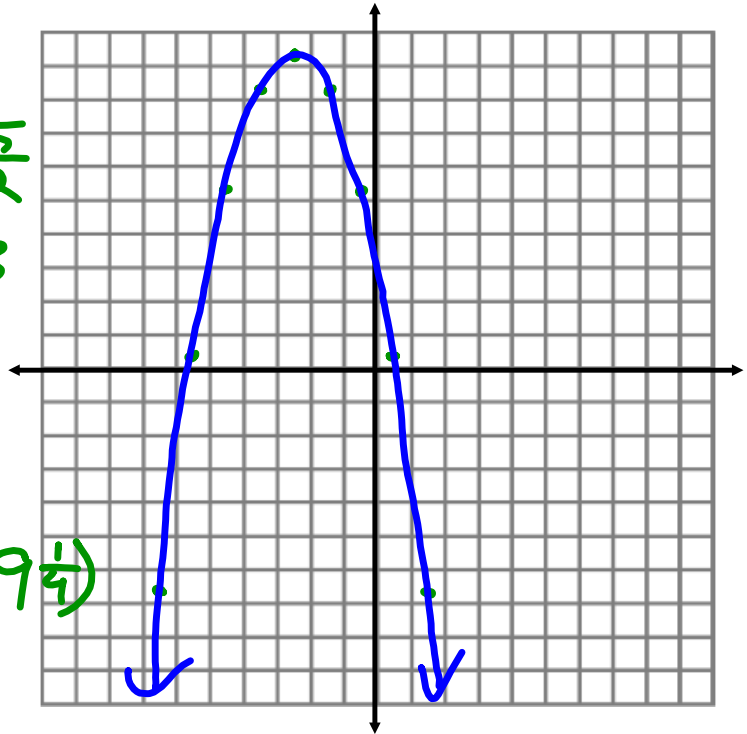
$$- \frac{-5}{2(-1)} = - \frac{-5}{-2} = - \frac{5}{2}$$

$$- \left(-\frac{5}{2}\right)^2 - 5\left(-\frac{5}{2}\right) + 3$$

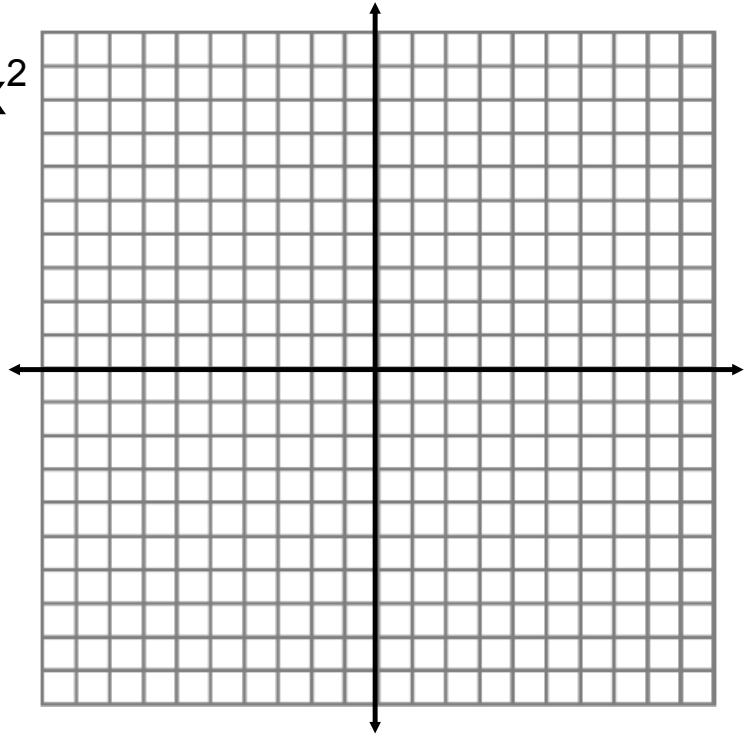
$$- \frac{25}{4} + \frac{25}{2} + 3$$

$$- \frac{25}{4} + \frac{50}{4} + \frac{12}{4}$$

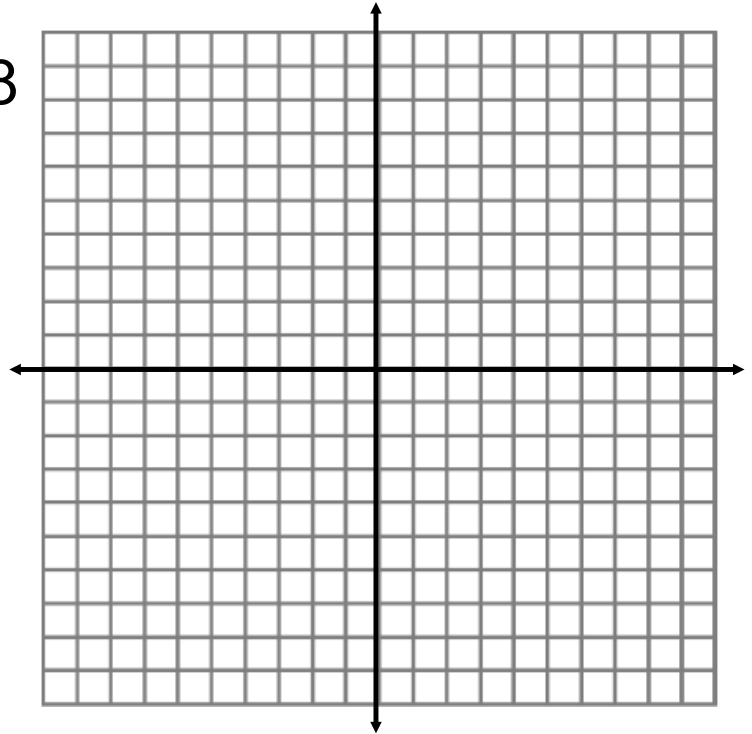
$$\frac{37}{4} \quad \left(-2\frac{1}{2}, 9\frac{1}{4}\right)$$



3) $Z(x) = 4 - (1/3)x^2$



4) $a(x) = x^2 - 6x + 8$



February 3, 2022

