

Warm up:

Graph.

$$f(x) = -3x^2 - 6x$$

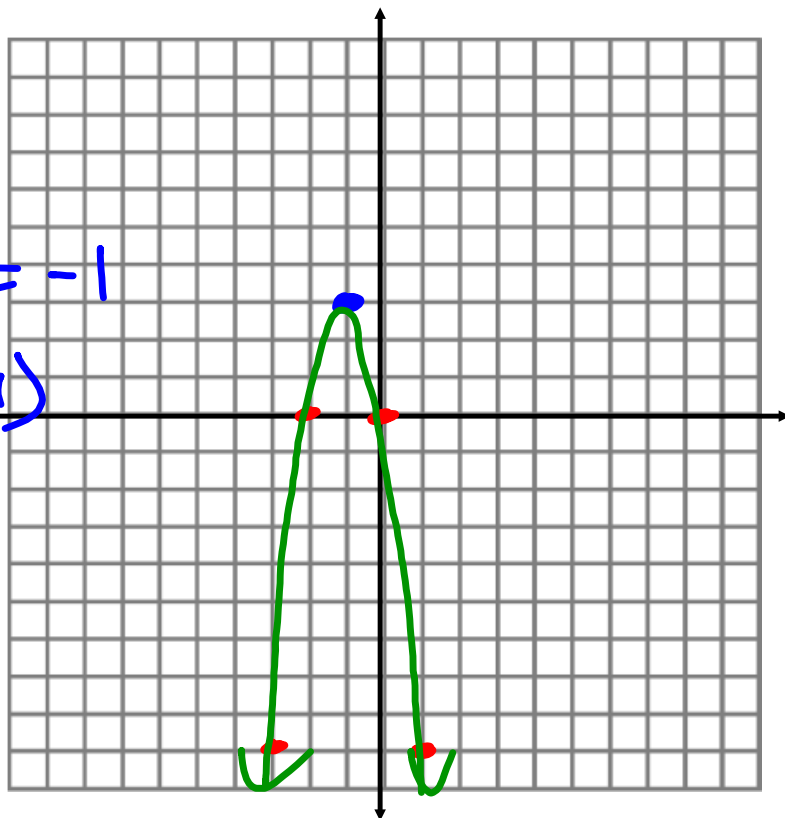
$$-\frac{-6}{2(-3)} = -\frac{-6}{-6} = -1$$

$$f(-1) = -3 - 6(-1)$$

$= -3 + 6$

$$x \quad 1 \quad 3 \quad 5 \dots$$

$$x^2 \quad 1 \quad 9 \quad 25 \dots$$



HW

$$(3) \quad g(x) = x^2 + 4$$

$$-\frac{b}{2a} = -\frac{0}{2(1)} = 0 \quad g(0) = 4$$

$$(0, 4) \quad x = 0$$

$$\text{min} = 4$$

$$(18) \quad h(x) = 1 - \frac{1}{3}x^2$$
$$-\frac{0}{2(-\frac{1}{3})} = 0 \quad h(0) = 0$$
$$(0, 1) \quad x = 0$$
$$\text{max} = 1$$

$$\textcircled{10} \quad k(x) = 1 - 3x - 6x^2$$

$$-\frac{-3}{2(-6)} = -\frac{-3}{-12} = -\frac{3}{12} = -\frac{1}{4}$$

$$k\left(-\frac{1}{4}\right) = 1 - 3\left(-\frac{1}{4}\right) - 6\left(-\frac{1}{4}\right)^2$$

$$\left(-\frac{1}{4}, \frac{3}{8}\right) \quad \left| \quad +\frac{3}{4} - 6\left(\frac{1}{16}\right)\right.$$

$$x = -\frac{1}{4}$$

$$\max = \frac{3}{8}$$

$$\frac{7}{4} - \frac{6}{16}$$

$$\frac{7}{4} - \frac{3}{8}$$

$$\frac{14}{8} - \frac{3}{8} = \frac{11}{8} = \frac{3}{8}$$

$$\frac{7}{4} - \frac{1}{4} + \frac{3}{4} - \frac{6}{16}$$

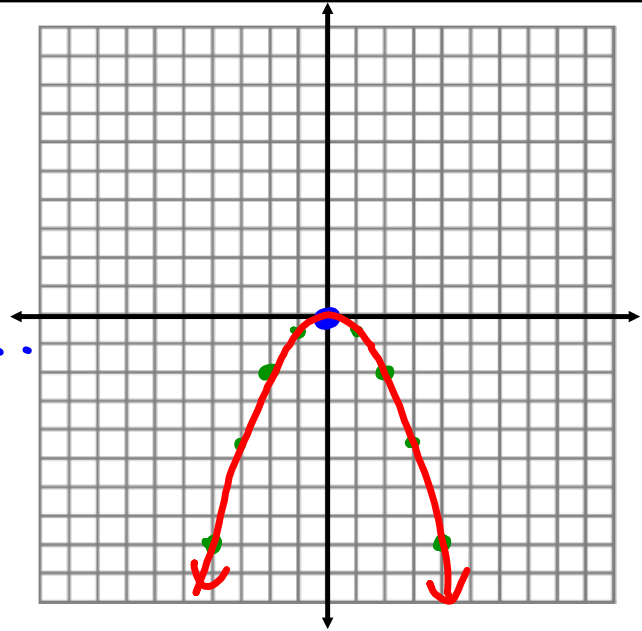
$$\frac{2}{3} \rightarrow \frac{5}{9} = \frac{10}{27}$$

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$$y = -\frac{1}{2}x^2$$

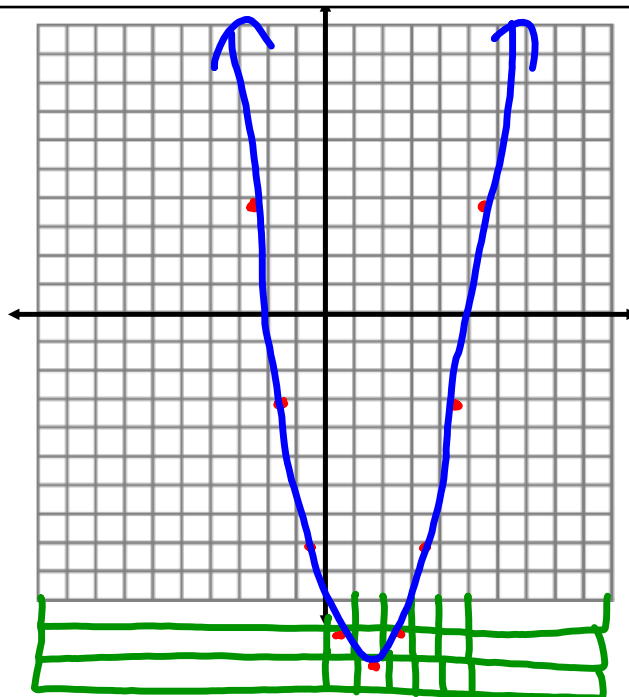
 $(0, 0)$

1	3	5	7	9	\dots
$\times \frac{1}{2}$	$\times \frac{1}{2}$	$\times \frac{1}{2}$	$\times \frac{1}{2}$	$\times \frac{1}{2}$	\dots
$\frac{1}{2}$	$\frac{3}{2}$	$\frac{5}{2}$	$\frac{7}{2}$	$\frac{9}{2}$	
$1\frac{1}{2}$	$2\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{1}{2}$		



② $(1\frac{1}{2}, -12\frac{1}{4})$

$$y = x^2 - 3x - 10$$



Quadratic Functions in Factored Form

$$f(x) = (x + 7)(x - 5)$$

$$f(x) = x^2 + 2x - 35 = 0$$

$$0 = (x + 7)(x - 5)$$

$$x = -7, 5$$

↑
x-intercepts
(zeros)

What information can we get from looking at these functions?

1) $g(x) = (x - 8)(x - 3)$

x-ints	facing
8 and 3	up

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

-2, 5	down
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3) $P(x) = (-x - 4)(-x + 7)$

-4, 7	up
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4) $T(x) = (x + 2)(5 - x)$

-2, 5	down
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$$-x + 7 = 0$$

$$-x = -7$$

$$\frac{-x}{-1} = \frac{-7}{-1}$$

$$x = 7$$