Unit 3 Review

Secondary 2H

Let $f(x) = x - 3$, $g(x) = x^2 - 4x$, $h(x) = -2x + 5$

Find $(f + g)(x)$

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

$= x^2 - 3x - 3$

Let $f(x) = x - 3$, $g(x) = x^2 - 4x$, $h(x) = -2x + 5$

Find $(h - g)(x)$

$h(x) - g(x) = (-2x+5) - (x^2 - 4x)$

$= -2x + 5 - x^2 + 4x$

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

Let $f(x) = x - 3$, $g(x) = x^2 - 4x$, $h(x) = -2x + 5$

Find $(fg)(x)$

$(x-3)(x^2-4x)$

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

$= \boxed{x^3 - 7x + 12x}$

Let $f(x) = x - 3$, $g(x) = x^2 - 4x$, $h(x) = -2x + 5$

Find $\left(\frac{h}{g}\right)(x)$

$\frac{h(x)}{g(x)} = \frac{-2x+5}{x^2-4x}$

Let $f(x) = x - 3$, $g(x) = x^2 - 4x$, $h(x) = -2x + 5$

What is the **domain** of $\left(\frac{h}{g}\right)(x)$?

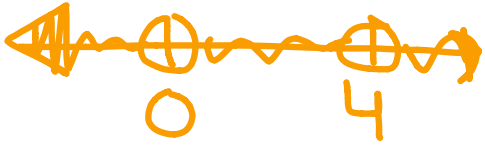
$\frac{h(x)}{g(x)} = \frac{-2x+5}{x^2-4x}$

Domain: $x^2 - 4x \neq 0$

$x(x-4) \neq 0$

$x \neq 0 \quad x-4 \neq 0$

$x \neq 0 \quad x \neq 4$



$(-\infty, 0) \cup (0, 4) \cup (4, \infty)$

Find the domain algebraically

$$f(x) = \sqrt{2x + 3}$$

$2x + 3 \geq 0$

$-3 \quad -3$

$\frac{2x}{2} \geq \frac{-3}{2}$

$x \geq \frac{-3}{2}$

Find the domain algebraically

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

$4x - 3 \neq 0$

$+3 \quad +3$

$4x \neq 3$

$\frac{4x}{4} \neq \frac{3}{4}$

$x \neq \frac{3}{4}$

Find the domain algebraically

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

NO "problem areas"

$\mathbb{R}$ $(-\infty, \infty)$

The cost in dollars of producing x toy cars is $C(x) = 2.4x + 1$. The revenue received is $R(x) = 7.50x$.

Write and simplify a function $P(x)$ that represents the profit in terms of x.

$P(x) = (7.5x) - (2.4x + 1)$

$P(x) = 5.1x - 1$

Find the profit of producing 50 toy cars.

$P(50) = 5.1(50) - 1$

$= 255 - 1 = \$254$

For the following questions, use $f(x) = |x|$ as your parent function. Write the new function that result from the given transformation.

- Translate (shift) the parent function **right** 2 units.

$f(x) = |x-2|$

For the following questions, use $f(x) = |x|$ as your parent function. Write the new function that result from the given transformation.

- Translate (shift) the parent function **left** 5 units.

$f(x) = |x + 5|$

- down 4 $f(x) = |x| - 4$
- up 7 $f(x) = |x| + 7$

For the following questions, use $f(x) = |x|$ as your parent function. Write the new function that result from the given transformation.

- Reflect the parent function across the **y-axis**.

$f(x) = |-x|$

For the following questions, use $f(x) = |x|$ as your parent function. Write the new function that result from the given transformation.

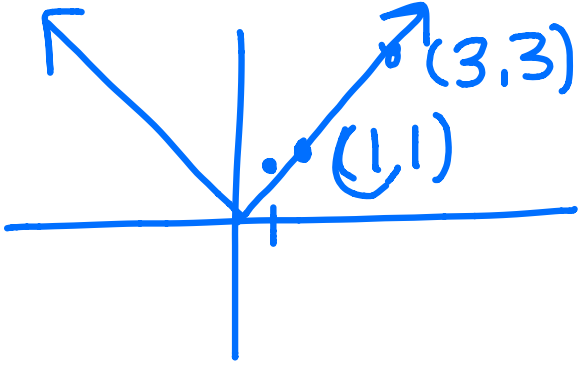
- Reflect the parent function across the **x-axis**.

$f(x) = -|x|$

For the following questions, use $f(x) = |x|$ as your parent function. Write the new function that result from the given transformation.

- Stretch the parent function horizontally by a factor of 1/3.

$f(x) = |3x|$



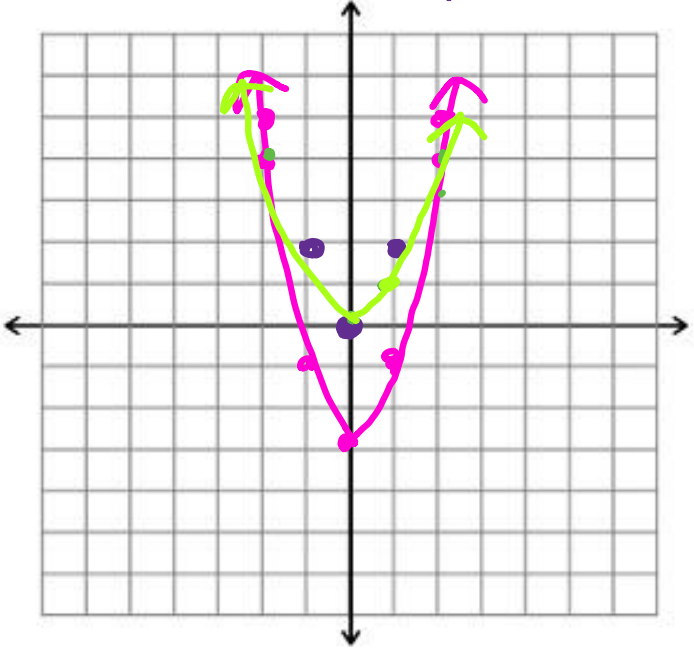
For the following questions, use $f(x) = |x|$ as your parent function. Write the new function that result from the given transformation.

- Stretch the parent function vertically by a factor of 5.

$f(x) = 5|x|$

For the following questions, use $f(x) = x^2$ as your parent function. Write the new function that result from the given transformation. Sketch the new function.

- Vertical stretch by a factor of 2 and translate (shift) down 3 units



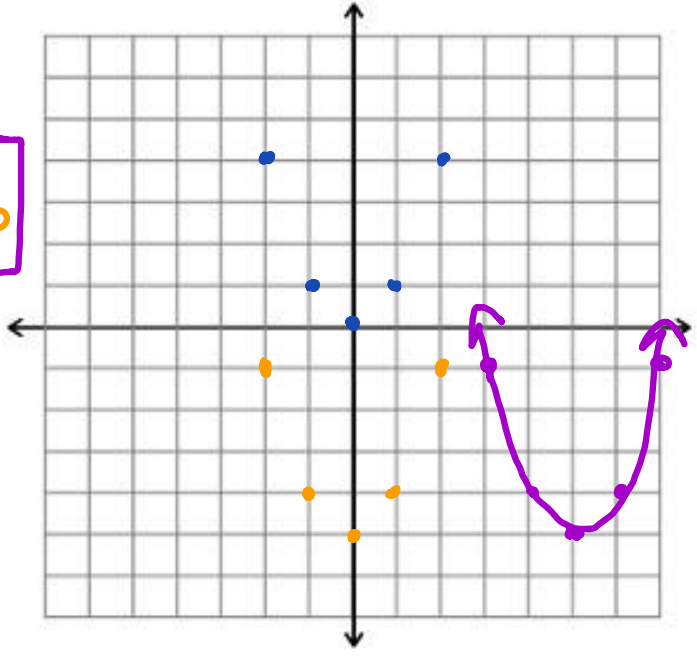
STRESS

$y = 2x^2 - 3$

For the following questions, use $f(x) = x^2$ as your parent function. Write the new function that result from the given transformation. Sketch the new function.

- Translate the graph down 5 units and to the right 6 units.

$F(x)=(x-6)^2-5$

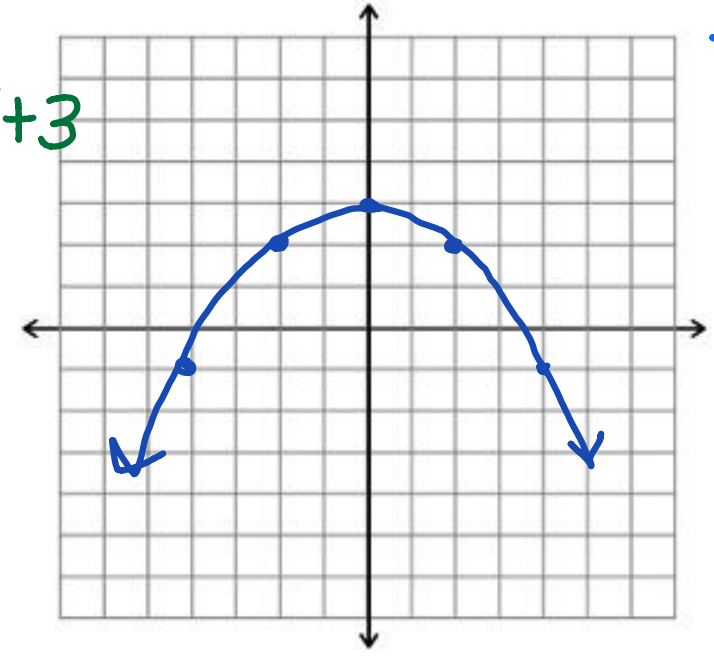


For the following questions, use $f(x) = x^2$ as your parent function. Write the new function that result from the given transformation. Sketch the new function.

- Reflect across the x-axis, horizontal stretch by a factor of 2 and translate the graph up 3 units.

Stress

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



Find the inverse of the following function.

$$f(x) = \frac{3x - 7}{4}$$

$4 \cdot x = \frac{3y-7}{4} \cdot 4$

$4x = 3y - 7$

$+7 \quad +7$

$4x + 7 = 3y$

$\frac{4x+7}{3} = \frac{3y}{3}$

$y = \frac{4x+7}{3}$

Find the inverse of the following function.

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

$x = 4y - 2$

$+2 \quad +2$

$\frac{x+2}{4} = \frac{4y}{4}$

$y = \frac{x+2}{4}$

Determine if the following functions are even, odd, or neither even nor odd.

$$f(x) = |x + 1| + 2$$

$f(-x) = |-x+1| + 2$

Neither

Determine if the following functions are even, odd, or neither even nor odd.

$$f(x) = 2x$$

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

$= -2x$

ODD

Determine if the following functions are even, odd, or neither even nor odd.

$$f(x) = -3x^3 - 4x$$

$$f(-x) = -3(-x)^3 - 4(-x)$$

$$= 3x^3 + 4x$$

ODD

Units 1 & 2

Secondary 2H

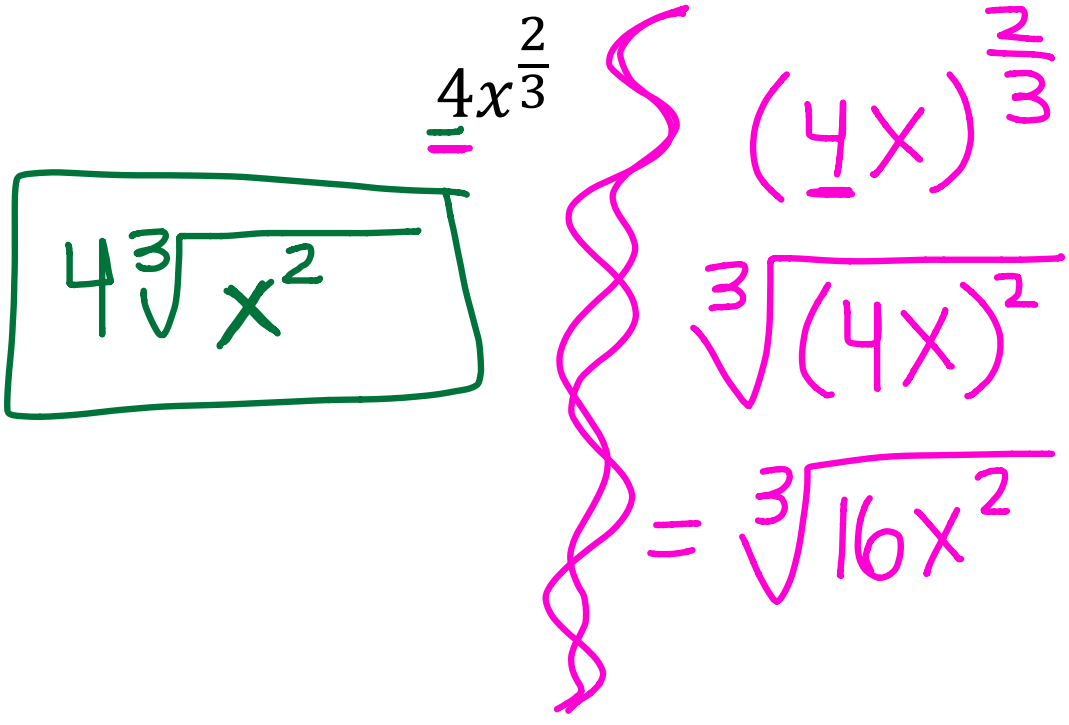
Factor the following polynomial

$$x^2 - 6x - 7$$

-7	-6
-7, 1	-6

$$(x-7)(x+1)$$

Rewrite the expression in radical form



Simplify

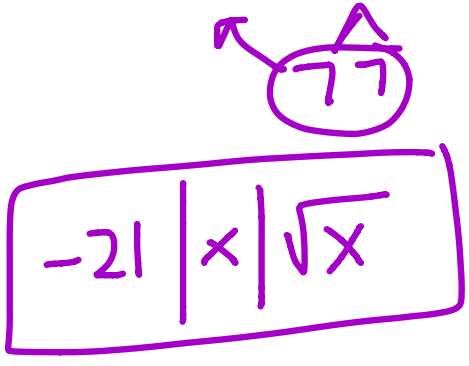
$$\left(x^4 x^{\frac{2}{3}}\right)^6$$

$$x^{24} x^{\frac{12}{3}} = x^{24} x^4$$

$$= x^{28}$$

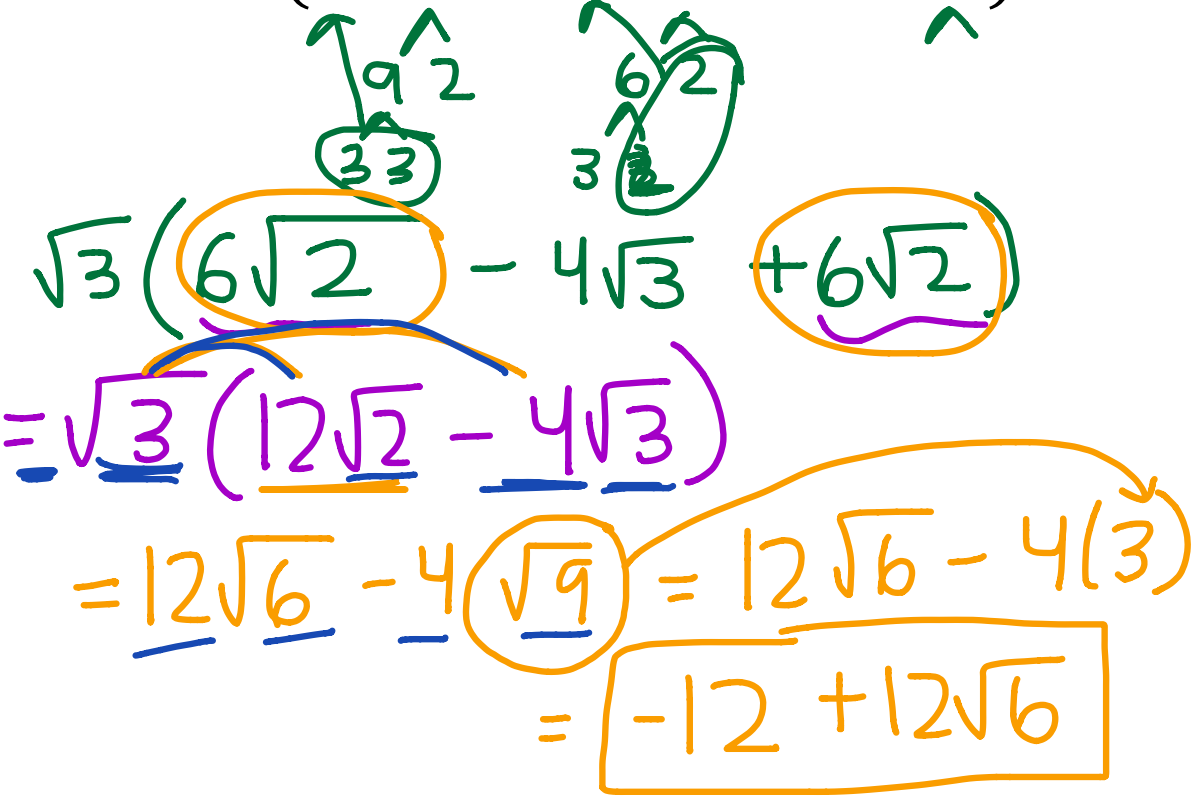
Simplify

$$-3\sqrt{49x^3}$$



Simplify

$$\sqrt{3}(2\sqrt{18} - 2\sqrt{12} + 2\sqrt{18})$$



Consider the table of values.

x	$f(x)$
-1	15
0	8
1	3
2	0
3	-1
4	0
5	3

a. Is the relation linear, exponential, or quadratic. Explain your reasoning.

Quadratic

b. What is the x-intercept(s)? (2,0) & (4,0)

c. What is the y-intercept? (0,8)

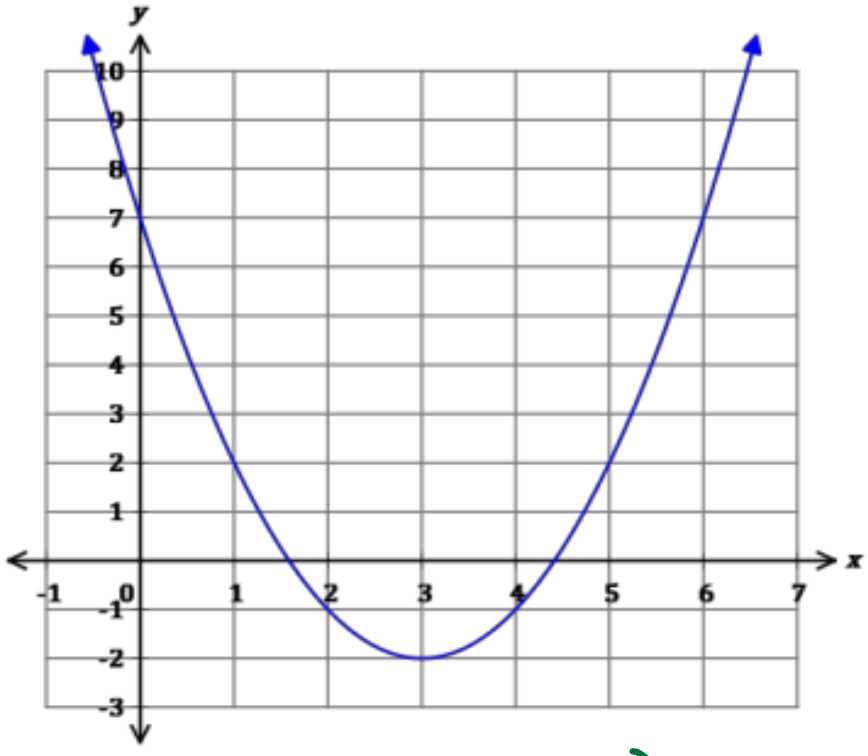
d. What is the vertex? (3,-1)

e. What is the axis of symmetry? $x = 3$

f. What is the max/min value? (REMEMBER the wording…)

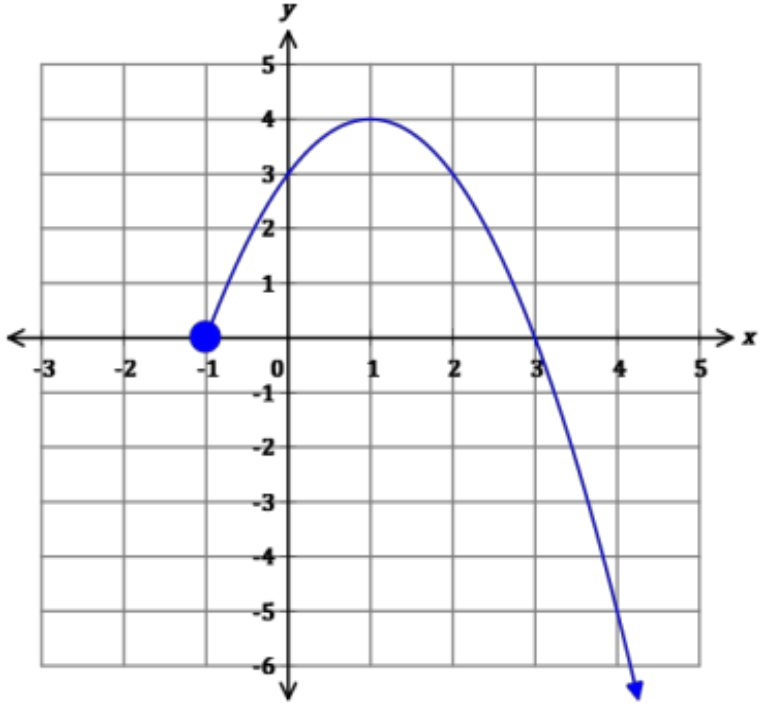
Min value is -1 when $x = 3$.

Identify the domain and range.



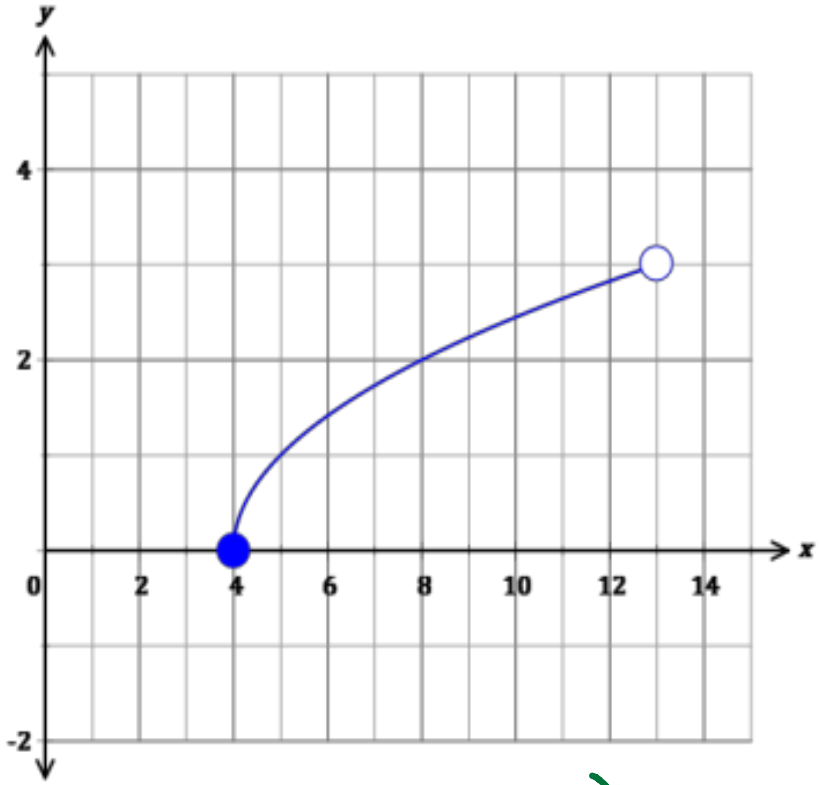
$D: (-\infty, \infty)$ $R: [-2, \infty)$

Identify the domain and range.



D: $[-1, \infty)$ R: $(-\infty, 4]$

Identify the domain and range.



D: [4,13) R: [0,3)