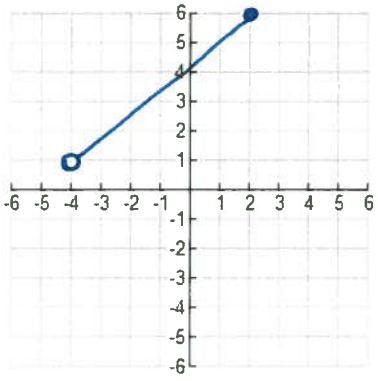
Mathematician Key

Test 4

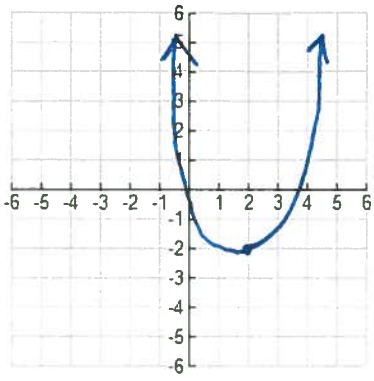
AF.3 Domain and Range _____ / 4 pts

1. Graph a line segment that has a domain of ~~(-4, -2]~~ (-4, 2]
Then write the range in **interval notation**.



Range: (1, 6]

2. Graph an quadratic function that has a range of $y \geq -2$. Write the domain in **inequality notation.**



Domain: x is all ℜ

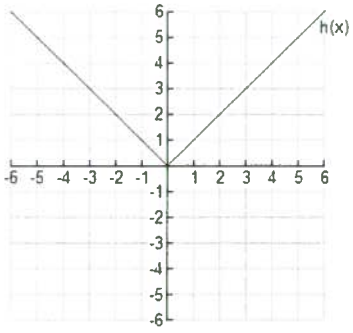
* answers ← may → vary *

AF.1 Transformations _____ / 4 pts

1. How does the graph of $f(x) = 2x - 5$ differ from the graph of $g(x) = \frac{1}{2}x + 2$

f(x) is a vertical stretch of 2 while g(x) is a vertical compression of $\frac{1}{2}$. f(x) is translated down 5 units and g(x) is translated up 2 units.

2. You want to reflect $h(x) = |x|$ over the y –axis and move it down 4. Your friend claims that it does not matter if you reflect the graph over the y –axis first then move it down 4, or if you move it down 4 first, then reflect it over the y –axis. Is your friend correct? Justify your answer.



Does not matter in this situation because moving up or down would not effect a flip over the y-axis. It however would on the x-axis.

Describe the transformation(s) from the parent function.

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

- horizontal stretch of $\frac{3}{2}$
- up 2 units

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

- flip over x-axis
- horizontal compression by $\frac{1}{3}$
- right 2 units

AF.2 Key Attributes

____ / 4 pts

Tell whether each statement is **sometimes true**, **always true**, or **never true**.

1. Linear functions have no x –intercept.

Sometimes true

* horizontal line could have no x-int.

2. The vertex of an absolute value function is a maximum.

Sometimes true

* could be a minimum

3. Quadratic functions have no x-intercepts.

Sometimes true

4. Exponential functions have a relative maximum or minimum.

never true

* above x-axis and faces up.

5. Rational functions have asymptotes.

always true

Identify the key attributes of each function.

5. $f(x) = \frac{4}{x} + 1$

x –intercept

(-4, 0)

Domain:

(x is $\mathbb{R}$, $x \neq 0$)

y –intercept

none

Range

(y is $\mathbb{R}$, $y \neq 1$)

asymptotes

$y = 1$

$x = 0$

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

x –intercept

none

Domain

$(-\infty, \infty)$

y –intercept

(0, -3)

Range

$(-\infty, -2]$

asymptote

$y = -2$