

Before we begin, are there any questions from last day's work?

Today's Learning Goal(s):

By the end of the class, I will be able to:

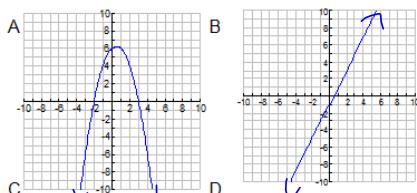
- consolidate understanding of domain and range.
- learn terminology of leading coefficient and end behaviour.

2.1.1: Match It!

Date: Sept. 24/18

Match each given function with the graph on the right-hand side.

1. C $y = 2x+1$

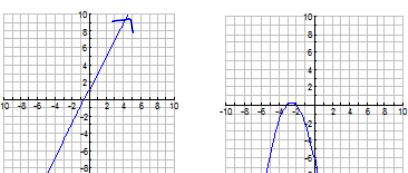


2. H $y = x^2 - x - 6$

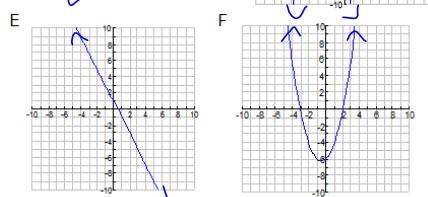
2. $y = x^2 - x - 6$

$$\begin{aligned} 0 &= (x+2)(x-3) \\ \downarrow & \quad \downarrow \\ x+2 &= 0 & x-3 &= 0 \\ x &= -2 & x &= 3 \end{aligned}$$

3. A $y = -x^2 + x + 6$



4. B $y = 2x-1$

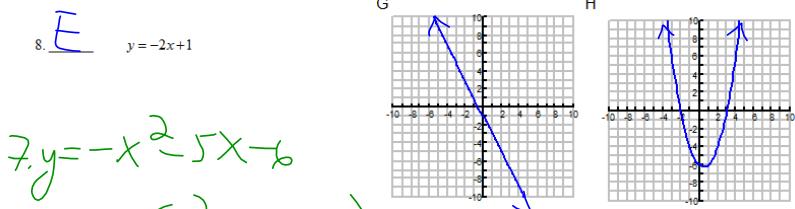


5. F $y = x^2 + x - 6$

$$\begin{aligned} 3. y &= -x^2 + x + 6 \\ &= -(x^2 - x - 6) \\ &= -(x+2)(x-3) \\ \therefore x &= -2 \text{ or } x = 3 \end{aligned}$$

6. G $y = -2x-1$

7. D $y = -x^2 - 5x - 6$



$$\begin{aligned} 7. y &= -x^2 - 5x - 6 \\ &= -(x^2 + 5x + 6) \\ &= -(x+2)(x+3) \end{aligned}$$

$$\therefore x = -2 \text{ or } x = -3$$

2.1.2: Linear and Quadratic Functions

Date: _____

Function	Domain and Range	Degree	Leading Coefficient	End Behaviour	Choices
1. $y = 2x + 1$	$\{x \in \mathbb{R}\}$ $\{y \in \mathbb{R}\}$	1	2	As $x \rightarrow \infty, y \rightarrow \infty$ As $x \rightarrow -\infty, y \rightarrow -\infty$	As $x \rightarrow \infty, y \rightarrow \infty$
2. $y = x^2 - x - 6$	$\{x \in \mathbb{R}\}$ $\{y \in \mathbb{R} / y \geq -6\}$	2	1	As $x \rightarrow \infty, y \rightarrow \infty$ As $x \rightarrow -\infty, y \rightarrow \infty$	As $x \rightarrow \infty, y \rightarrow \infty$
3. $y = -x^2 + x + 6$	$\{x \in \mathbb{R}\}$ $\{y \in \mathbb{R} / y \leq 6.1\}$	2	-1	As $x \rightarrow \infty, y \rightarrow -\infty$ As $x \rightarrow -\infty, y \rightarrow -\infty$	As $x \rightarrow -\infty, y \rightarrow -\infty$
4. $y = 2x - 1$	$\{x \in \mathbb{R}\}$ $\{y \in \mathbb{R}\}$	1	2	As $x \rightarrow \infty, y \rightarrow \infty$ As $x \rightarrow -\infty, y \rightarrow -\infty$	$\{x \in \mathbb{R}\}$ $\{y \in \mathbb{R}\}$
5. $y = x^2 + x - 6$	$\{x \in \mathbb{R}\}$ $\{y \in \mathbb{R} / y \geq -6.2\}$	2	1	As $x \rightarrow \infty, y \rightarrow \infty$ As $x \rightarrow -\infty, y \rightarrow \infty$	$\{x \in \mathbb{R} / \}$ $\{y \in \mathbb{R} / \}$
6. $y = -2x - 1$	$\{x \in \mathbb{R}\}$ $\{y \in \mathbb{R}\}$	1	-2	As $x \rightarrow \infty, y \rightarrow -\infty$ As $x \rightarrow -\infty, y \rightarrow \infty$	
7. $y = -x^2 - 5x - 6$	$\{x \in \mathbb{R}\}$ $\{y \in \mathbb{R} / y \leq 0.05\}$	2	-1	As $x \rightarrow \infty, y \rightarrow -\infty$ As $x \rightarrow -\infty, y \rightarrow -\infty$	
8. $y = -2x + 1$	$\{x \in \mathbb{R}\}$ $\{y \in \mathbb{R}\}$	1	-2	As $x \rightarrow \infty, y \rightarrow -\infty$ As $x \rightarrow -\infty, y \rightarrow \infty$	

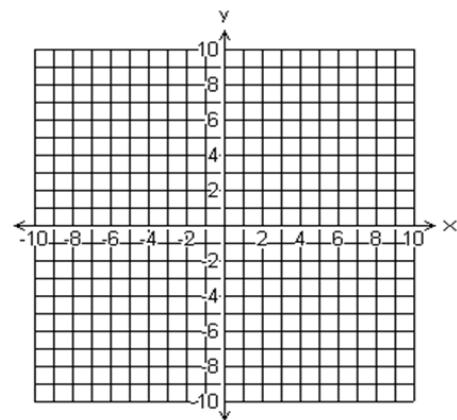
2.1.3: Linear and Quadratic Functions – Practice

Date: _____

For each of the given functions, sketch the graph of the relation, creating a table of values if necessary. Use the graph and the equation to fill in the table relating to each graph.

1. $y = -3x + 2$

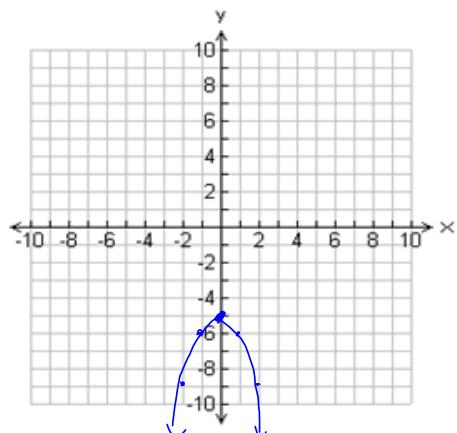
Domain	
Range	
Degree	
Sign of Leading Coefficient	
End Behaviour	
Is the relation a function?	



2. $y = -x^2 - 5$

$\sqrt{(0, -5)}$

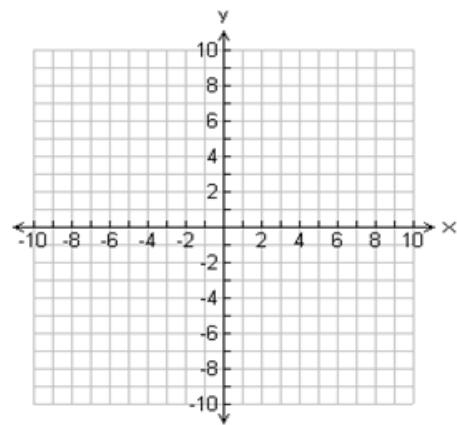
Domain	$\{x \in \mathbb{R}\}$
Range	$\{y \in \mathbb{R} y \leq -5\}$
Degree	2
Sign of Leading Coefficient	-
End Behaviour	$x \rightarrow \infty, y \rightarrow -\infty$ $x \rightarrow -\infty, y \rightarrow -\infty$
Is the relation a function?	Yes



$y = -(x-0)^2 - 5$

3. $y = \frac{1}{2}x + 4$

Domain	\mathbb{R}
Range	\mathbb{R}
Degree	1
Sign of Leading Coefficient	+
End Behaviour	As $x \rightarrow \infty, y \rightarrow \infty$ As $x \rightarrow -\infty, y \rightarrow -\infty$
Is the relation a function?	Yes



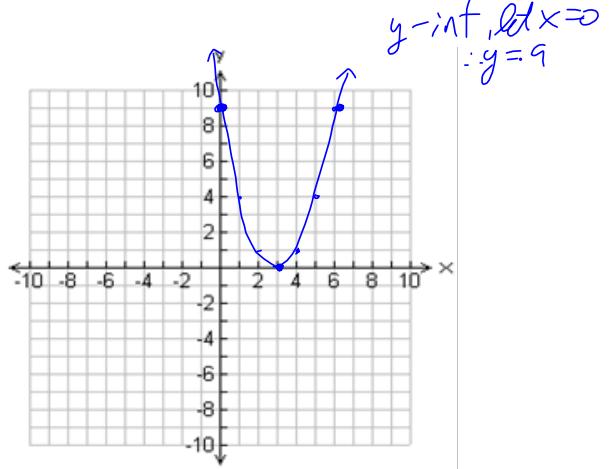
4. $y = x^2 - 6x + 9$

$= (x-3)(x-3)$

$y = (x-3)^2$

$v(3, 0)$

Domain	\mathbb{R}
Range	$\{y \in \mathbb{R} y \geq 0\}$
Degree	2
Sign of Leading Coefficient	+
End Behaviour	$x \rightarrow \infty, y \rightarrow \infty$ $x \rightarrow -\infty, y \rightarrow \infty$
Is the relation a function?	Yes



5. Is it possible to graph a line of the form $y = mx + b$ that will not result in a function?
Explain your reasoning.

6. Is it possible to graph a quadratic relation of the form $y = ax^2 + bx + c$ that will not result in a function?
Explain your reasoning.