## Lesson 24: Quadratic Situations

* Let’s work with situations and quadratic equations.

### 24.1: Growing Plants

Plant A’s height over time is represented by $y=\frac{1}{2}x+4$. Plant B’s height is $y=\frac{1}{3}x+3$ for which $x$ represents the number of weeks since the plants were found, and $y$ represents the height in inches.



1. Which graph goes with which equation? How do you know?
2. What is a pair of values that works for Plant A but not B? What does it represent?
3. What is a pair of values that works for Plant B but not A? What does it represent?
4. What is a pair of values that works for both plants? What does it represent?

### 24.2: Diego’s Plant

1. The height, in centimeters, of Diego’s plant is represented by the equation $p(t)=-0.5(t−10)^{2}+58$ where $t$ represents the number of weeks since Diego has started nurturing the plant. Determine if each statement is true or false. Explain your reasoning.
	* Diego’s plant shrinks each week.
	* Diego’s plant is 8 cm tall when he starts to nurture it.
	* Diego’s plant grows to be 58 cm tall.
	* The plant shrinks 4 weeks after Diego begins to nurture it.
2. Write your own true statement about Diego’s plant.

### 24.3: Making the Grades

Jada’s quiz grade after $h$ hours of studying is given by the equation $Q(h)=10h+70$. Her test grade after $h$ hours of studying is given by the equation $T(h)=6h+76$.

Here’s a graph of both functions:



1. Which graph represents Jada’s quiz grade after $h$ hours of studying?
2. What do the $y$-intercepts of the lines mean in this situation?
3. Find the coordinates of the $y$-intercepts.
4. The 2 lines intersect at a point. What does that point represent in this situation?
5. Find the coordinates of the intersection point. Explain or show your reasoning.



© CC BY 2019 by Illustrative Mathematics®