

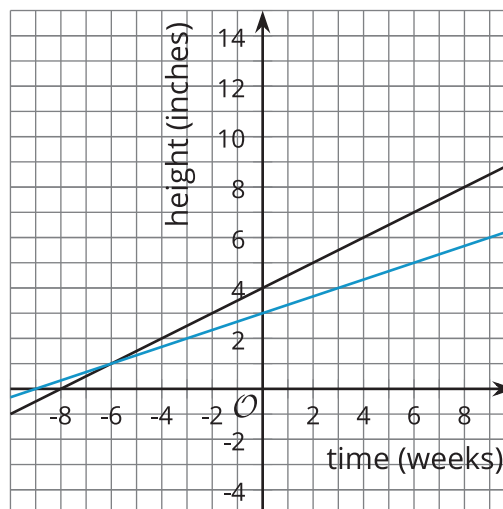


# Quadratic Situations

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.



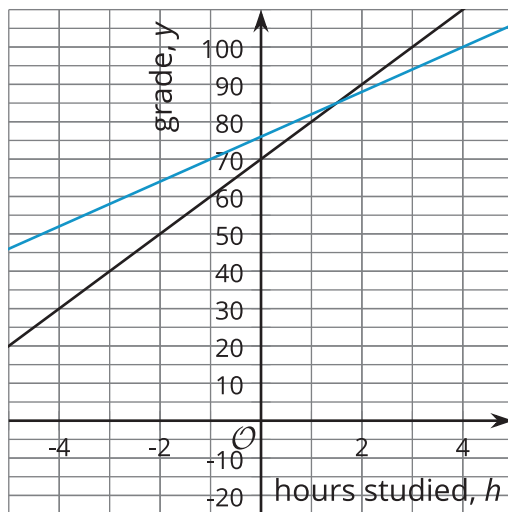
1. Which graph goes with which equation? How do you know?
2. What is a pair of values that works for Plant A but not B? What does it represent?
3. What is a pair of values that works for Plant B but not A? What does it represent?
4. What is a pair of values that works for both plants? What does it represent?

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. Decide if each statement is true or false. Explain your reasoning.
  - Diego's plant shrinks each week.
  - Diego's plant is 8 centimeters tall when he starts to nurture it.
  - Diego's plant grows to be 58 centimeters 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.