Calculating Slope

Let's calculate slope from two points.

10.1 Math Talk: Integer Operations

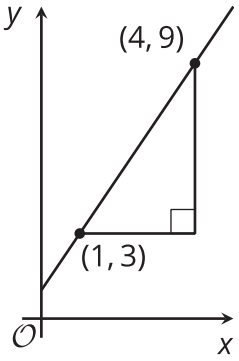
Mentally find values for a and b that make each equation true.

- $a + b = -2$
- $a - b = -2$
- $\frac{a}{b} = 2$
- $\frac{a}{b} = -2$

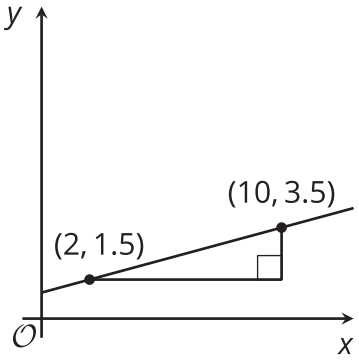
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10.2 Toward a More General Slope Formula

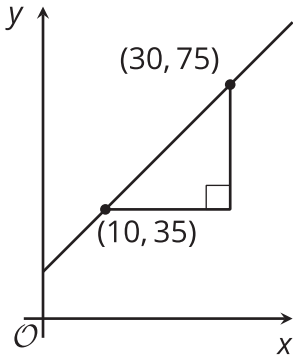
A



B



C



1. For each graph, record:

	vertical change	horizontal change	slope
A			
B			
C			

2. Describe a procedure for finding the slope between any two points on a line.

Are you ready for more?

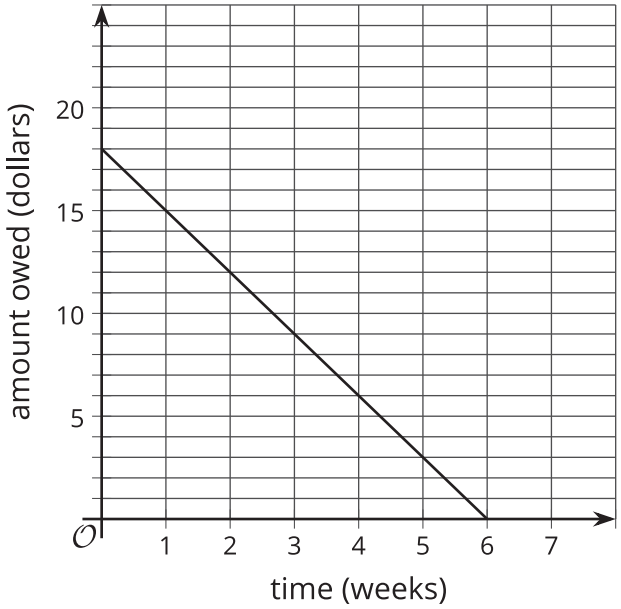
Find the value of k so that the line passing through each pair of points has the given slope.

1. $(k, 2)$ and $(11, 14)$, slope = 2
2. $(1, k)$ and $(4, 1)$, slope = -2
3. $(3, 5)$ and $(k, 9)$, slope = $\frac{1}{2}$
4. $(\text{-}1, 4)$ and $(\text{-}3, k)$, slope = $\frac{\text{-}1}{2}$
5. $\left(\frac{\text{-}15}{2}, \frac{3}{16}\right)$ and $\left(\frac{\text{-}13}{22}, k\right)$, slope = 0

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10.3 Payback Plan

Elena borrowed some money from her brother. She pays him back by giving him the same amount every week. The graph shows how much she owes after each week.



Answer and explain your reasoning for each question.

1. What is the slope of the line?
2. Explain how you know whether the slope is positive or negative.

3. What does the slope represent in this situation?

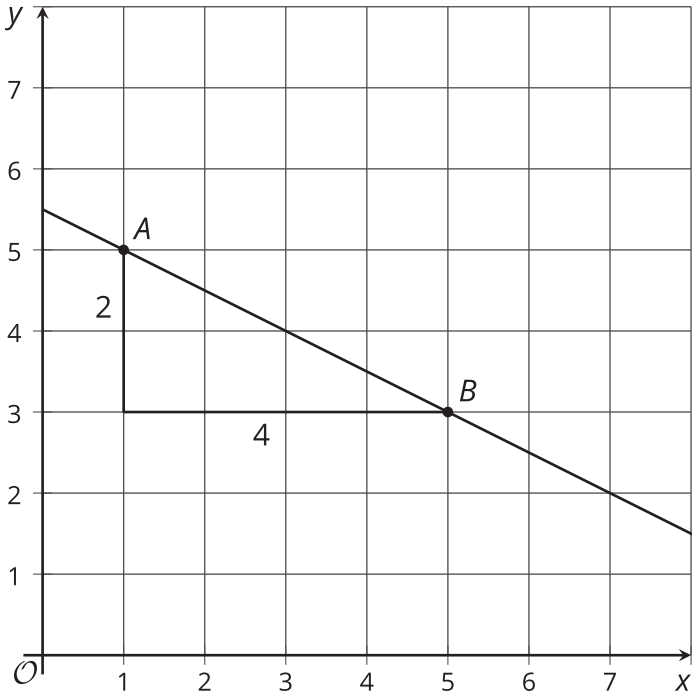
4. How much did Elena borrow?

5. How much time will it take for Elena to pay back all the money she borrowed?

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Lesson 10 Summary

One way to calculate the slope of a line is by drawing a slope triangle. For example, using this slope triangle, the slope of the line is $-\frac{2}{4}$, or $-\frac{1}{2}$. The slope is negative because the line is decreasing from left to right.



Another way to calculate the slope of this line uses just the points $A : (1, 5)$ and $B : (5, 3)$. The slope is the vertical change divided by the horizontal change, or the change in the y-values divided by the change in the x-values. Between points A and B, the y-value change is $3 - 5 = -2$ and the x-value change is $5 - 1 = 4$. This means the slope is $-\frac{2}{4}$, or $-\frac{1}{2}$, which is the same value as the slope calculated using a slope triangle.

Notice that in each of the calculations, the value from point A was subtracted from the value from point B. If it had been done the other way around, then the y-value change would have been $5 - 3 = 2$ and the x-value change would have been $1 - 5 = -4$, which still gives a slope of $-\frac{1}{2}$.

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