

29 Sue and Kathy were doing their algebra homework. They were asked to write the equation of the line that passes through the points $(-3, 4)$ and $(6, 1)$. Sue wrote $y - 4 = -\frac{1}{3}(x + 3)$ and Kathy wrote $y = -\frac{1}{3}x + 3$. Justify why both students are correct.

Sue

$$y - 4 = -\frac{1}{3}(x + 3)$$

$$y - 4 = -\frac{1}{3}x - 1$$

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

Kathy

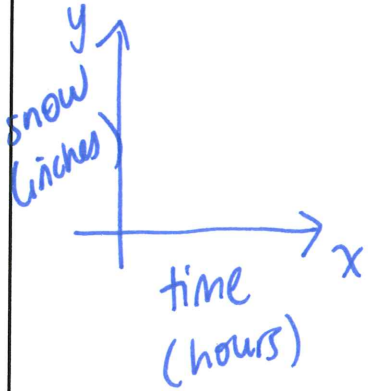
$$y = -\frac{1}{3}x + 3$$

Both students are correct because Sue and Kathy's equations are the same / equivalent.

Therefore, both lines pass through these points.

30 During a recent snowstorm in Red Hook, NY, Jaime noted that there were 4 inches of snow on the ground at 3:00 p.m., and there were 6 inches of snow on the ground at 7:00 p.m.

If she were to graph these data, what does the slope of the line connecting these two points represent in the context of this problem?



hour x	snow (in) y
3:00pm	4 in.
7:00pm	6 in.

The slope of the line would represent the amount of snow in inches falling per hour.

35 An airplane leaves New York City and heads toward Los Angeles. As it climbs, the plane gradually increases its speed until it reaches cruising altitude, at which time it maintains a constant speed for several hours as long as it stays at cruising altitude. After flying for 32 minutes, the plane reaches cruising altitude and has flown 192 miles. After flying for a total of 92 minutes, the plane has flown a total of 762 miles.

Determine the speed of the plane, at cruising altitude, in miles per minute.

x	y
32	192
92	762

+60 () ↗ +570

$$\frac{\Delta y}{\Delta x} = \frac{570}{60} = 9.5$$

The speed is 9.5 miles per minute.

Write an equation to represent the number of miles the plane has flown, y , during x minutes at cruising altitude, only.

slope = 9.5
y-int. = 0

$$y = 9.5x$$

Assuming that the plane maintains its speed at cruising altitude, determine the total number of miles the plane has flown 2 hours into the flight.

