

Math-2A
Lesson 4-9
More Applications of Linear
Equations

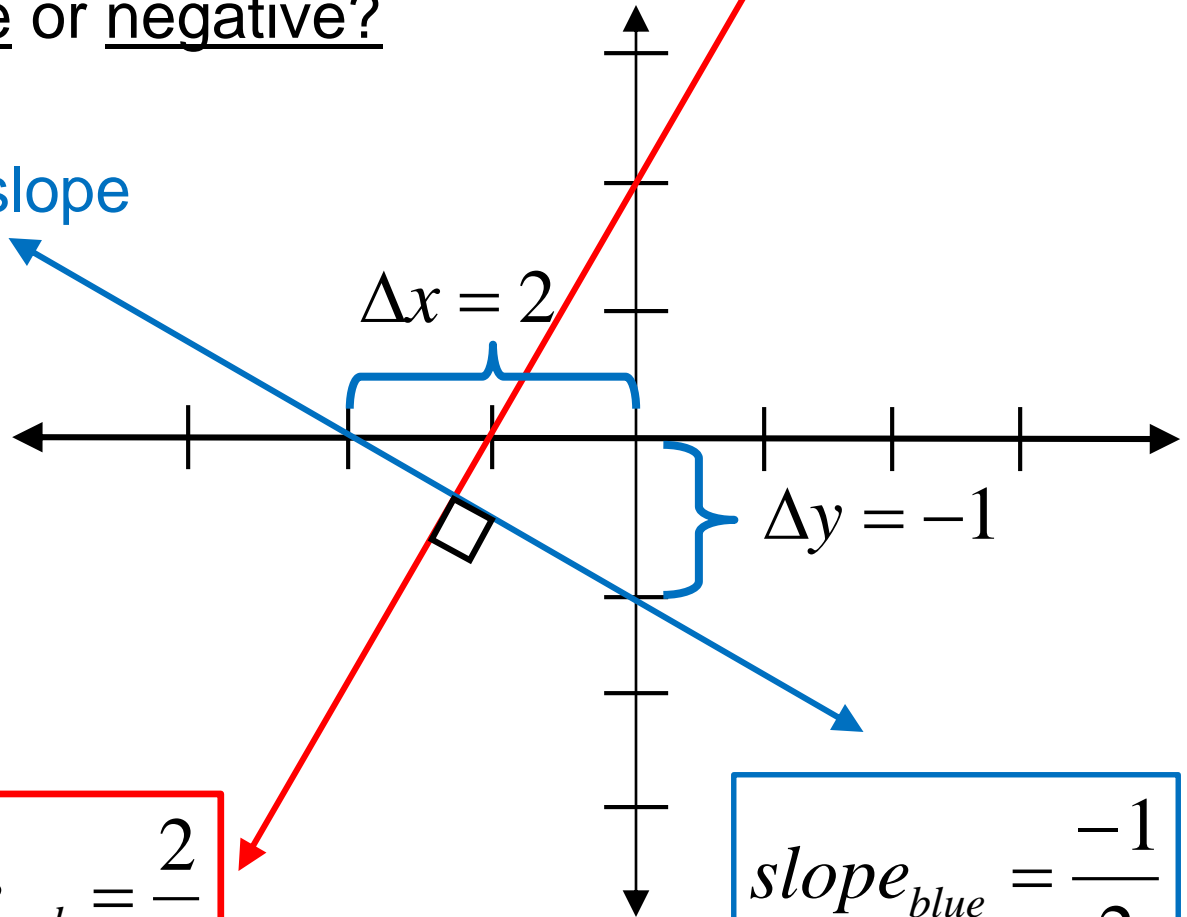
slopes of perpendicular lines are

1. reciprocals of each other.
2. opposite signs (+/-) of each other.

Is the slope positive or negative?

Negative slope

Positive slope



$$slope_{red} = \frac{2}{1}$$

$$slope_{blue} = \frac{-1}{2}$$

What two things do we know about the slopes of perpendicular lines?

The slopes are reciprocals of each other.

The slopes have opposite signs of each other.

The slopes of perpendicular lines are negative reciprocals of each other.

What is the slope a line that is perpendicular to each of the following?

$$y = 2x + 1$$

$$y = \frac{5}{9}x + 2$$

$$y = -\frac{3}{2}x - 4$$

$$y = -\frac{1}{6}x - 7$$

Find the slope intercept form of a line that is perpendicular to the line:

$$y = 2x - 6 \quad \text{and passes through the point } (0, 1)$$

Find the slope intercept form of a line that is perpendicular to the line:

$$y = \frac{1}{5}x - 8 \quad \text{and passes through the point } (5, 2)$$

What is the equation of the line that can represent this data?

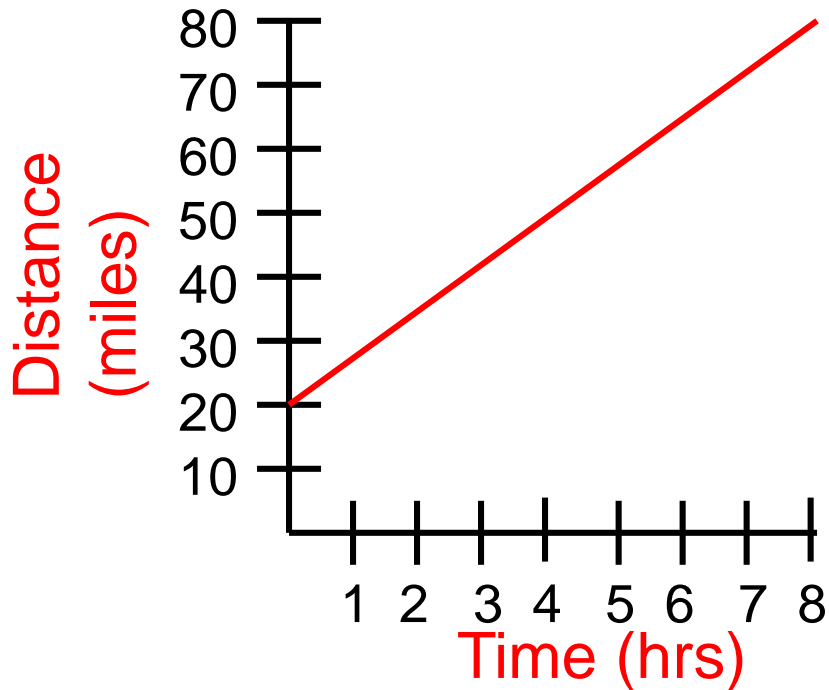
Time (min)	0	1	2	3	4
Height (ft)	500	450	400	350	300

Year	1900	1910	1920	1930	1940
Population (millions)	100	125	150	175	200

What is the equation of the line that can represent this data?

Time	11 AM	11:30 AM	12 PM	12:30 PM	1 PM
distance (miles)	50	75	100	125	150

Time (yrs)	1987	1991	1995	1999	2003
Trade deficit (Billions of \$'s)	36.0	32.8	29.6	26.4	23.2



Write the equation: $y = mx + b$

What are the “units” of slope for this problem?

Slope: $(0, 20) \rightarrow (8, 80)$

$$m = \frac{\text{rise}}{\text{run}} = \frac{60 \text{ miles}}{8 \text{ hrs}}$$

$$m = 7.5 \frac{\text{miles}}{\text{hr}}$$

$$y = 7.5x + 20$$

Your parents are paying “big bucks” for your health club membership. You go to the health club 4 days/week. The time it takes to walk/run 3 miles at the end of each week has been graphed. Write an equation for the relation.

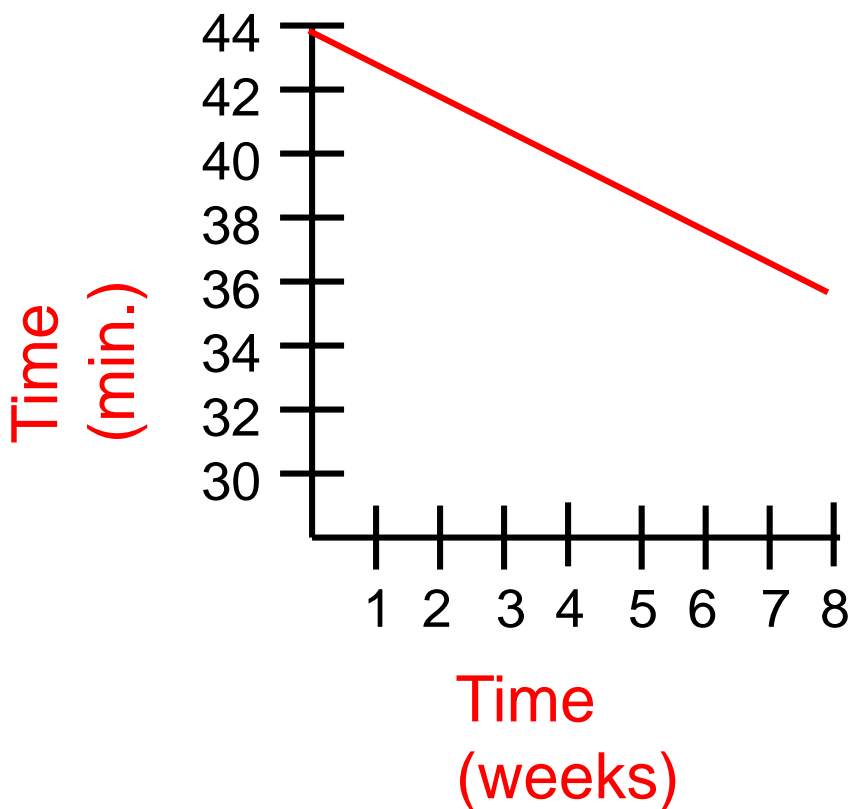
$$y = mx + b$$

Slope: $(0, 44) \rightarrow (8, 36)$

$$m = \frac{\text{rise}}{\text{run}} = \frac{-8 \text{ min}}{8 \text{ weeks}}$$

$$m = -1 \frac{\text{min}}{\text{wk}}$$

$$y = -x + 44$$



During the first 5 weeks of your exercise program you record your weight.

End of Week, w	0	1	2	3	4	5
weight, y (lb.)	186	183	180	177	174	171

Determine the average rate of change of your weight during the 5-week period.

Assuming your weight loss will continue at the same rate, write an equation that relates your weight to the number of weeks on the exercise program.

You decide to buy a new Honda Civic, but you are concerned about the value of the car depreciating over time. You search the Internet and obtain the following information.

Suggested Retail Price: \$20,905

Depreciation per year: \$1750 (assume constant)

1) What does this mean?

2) Complete the table.

“V” is the value of the car after “n” years of ownership

n (years)	0	1	2	3	5	8
V, (\$)	20,905	19,155	17405	15,655	12,155	6905

3) Write the equation that predicts the value of the car based upon its age in the year.

A car rental company charges: \$60 per day plus \$0.75 per mile

You decide the rent the car for a day. Fill in the remainder of the table.

Write the equation that predicts the cost of renting the car based upon how many miles are driven.

$$C_A(m) = 0.75m + 60$$

"m" miles	Total Cost
0	
50	
100	
150	
200	
250	
300	

How much would your bill be if you drove the car 525 miles?

Hamburgers cost \$5 and drinks cost \$2.

If you can spend a total of \$50, fill in the total number of hamburgers and drinks that you can buy.

Write an equation for this table.

Hamburgers	drinks
0	
2	
4	
6	
8	
10	

$$D = -\frac{5}{2}H + 25$$