Linear Functions

$$y = mx + b$$
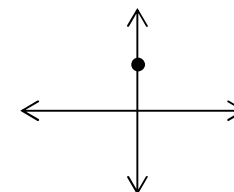
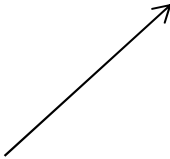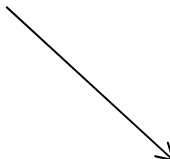Slope m $\dfrac{\text{rise} \uparrow}{\text{run} \rightarrow}$ y-intercept b

- Tells you the average rate of change
- Is the quantity that is repeated
- Is always found next to a variable

- Is where the line crosses the y-axis
- Is the value of y when x is zero
- Is the starting or initial value
- Is the quantity that is paid one time

Positive Slope	Negative Slope	Zero Slope	Undefined Slope
Uphill, increasing	Downhill, decreasing	Flat, horizontal	Vertical
y = +mx + b	y = -mx + b	y = number	**x = number**

Linear Functions

Select the correct function for the situation.

1. Michael bought a used truck. He made a down payment of $800 and had monthly payments of $250. The number of months = m and the amount that Michael paid = a.
    a. $a = 800m + 250$
    b. $a = 250m + 800$
    c. $a = (800 - 250)m$
    d. $a = 800m - 250$

2. A package thrown from an airplane that was flying at 6000 feet and it fell at an average rate of 87 feet per second. t = the time since the package started falling and h = the height above the ground.
    a. $h = 87t + 6000$
    b. $h = 6000t + 87$
    c. $h = 6000 - 87t$
    d. $h = (6000 - 87)t$

3. Kelly had $425 in her savings account, but then she started depositing $30 every week and her savings grew quickly. After 35 weeks, she had enough money to buy a new phone. w = the number of weeks and b = the balance in Kelly's account.
    a. $b = 30w + 425$
    b. $b = 35w + 425$
    c. $b = 425w + 30$
    d. $b = 425x + 35$

4. Bubba ate 4 jalapeños on Monday, 6 jalapeños on Tuesday, and 8 jalapeños Wednesday. Bubba continues this pattern of eating jalapeños. n = the number of jalapeños and d = the days that have passed since he started.
    a. $n = 4d + 8$
    b. $n = 4d + 2$
    c. $n = 2d + 4$
    d. $n = 6d - 8$

Rearrange the equation to solve for x.

5. $y = 7x - 12$

6. $y = 15 + 2.6x$

7. $y = 0.591x + 145.2$

8. $y = 392 - 1.65x$

Direct Variation

9. If $y = kx$, where k is a constant, and $y = 36$ when $x = 4$, what is the value of y when $x = 6$?

10. If $y = kx$, where k is a constant, and $y = 5$ when $x = 2$, what is the value of y when $x = 8$?

11. If $y = kx$, where k is a constant, and $y = 4$ when $x = 64$, what is the value of y when $x = 16$?