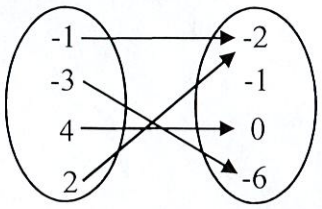
It is a one to one function when every element of the range of the function corresponds to exactly one element of the domain. y = $f(x)$ is a function if it passes the vertical line test. It is a 1-1 function if it passes both the vertical line test and the horizontal line test. (It's inverse is a function)

1. {(1, 2), (2, 3), (-3, 1), (4, 5), (0, -2)}

2.

x	y
1	1
-2	4
3	-2
-2	1

3.



What is the inverse of each?

(2,1)(3,2)(1,-3)(5,4)(-2,0) (1,1)(4,-2)(-2,3)(1,-2) (-2,-1)(-2,2)(0,4)(-6,-3)

Is it a Function? yes Is it a Function? no Is it a Function? yes

Is the inverse a function? yes Is the inverse a function? no Is the inverse a function? no

Is it one to one? yes Is it one to one? no Is it one to one? no

4. You landed a job making $8.00 an hour and the following graph represents your earnings over a 5 hour shift. Unfortunately, you have to stop and put $12 in your car for gas. You get home after an hour. Let's look at the graph.

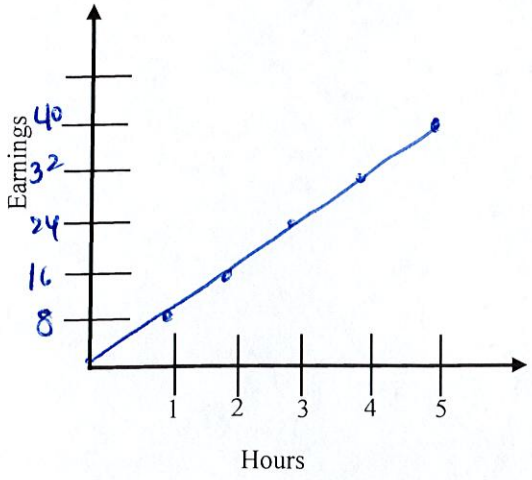
Hour	Earning
1	8
2	16
3	24
4	32
5	40

A. Which variable is the independent variable? hour

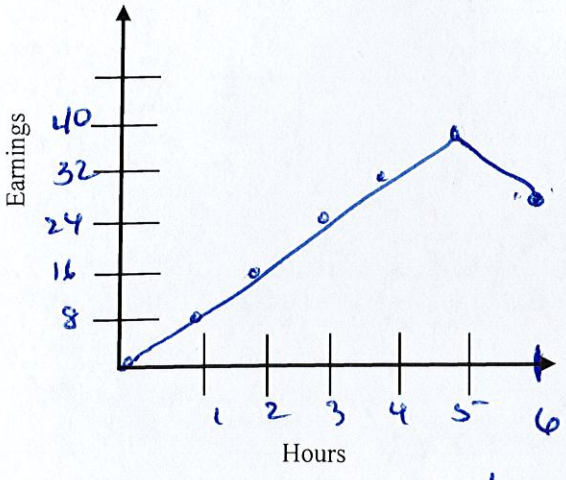
B. Which variable is the dependent variable? earning

C. Does this represent a function? yes

Let's graph your earnings for your day.



Let's look at the graph after getting gas.



5. {(0,2),(3, -6), (-3, 1), (4, 5), (0, -2), (8,-1)}

Find $f(-3)$ = 1 $f(8)$ = -1 $f(0)$ = -2

Function Notation: If the graph is a function we can use $f(x)$ instead of y

Ex: $y = 3x - 4$ so $f(x) = 3x - 4$

If $g(x) = 3x + 2$

Find: $g(3) = 11$ (3(3)+2)

$g(-1) = -1$

$g(-5) = -13$

$f(x) = 2x - 3$

$f(-1) = -5$ (2(-1)-3)

$f(4) = 5$ (2(4)-3)

$f(1/2) = -2$ (2(½)-3)

$p(x) = -3x - 5$

$p(-2) = 1$ (p(-2) = -3(-2)-5)

$p(3) = -14$

$p(2/3) = -7$ ($-3\left(\frac{2}{3}\right) - 5$, $-\frac{6}{3} - 5 = -7$)

Linear Equation: an equation whose graph is a line, may have one or two variables.

Ex: Linear

$y = 3x - 1$

$y = -2x + 5$

$y = 4$

$x = -2$

Not

$y = x^2$

$y = -2x^3$

$y = \sqrt{x}$

$y = \frac{1}{x}$

Slopes or Rate of Change:

Slope: steepness, ratio of changing vertically to changing horizontally.

Slope Formula: $m = \frac{y_2 - y_1}{x_2 - x_1}$

Ex: (3,-5) and (6,8) ($x_1\ y_1$ $x_2\ y_2$)

$m = \frac{8 - (-5)}{6 - (3)} = \frac{13}{3}$

Ex: (2,-1) and (6,-3) ($x_1\ y_1$ $x_2\ y_2$)

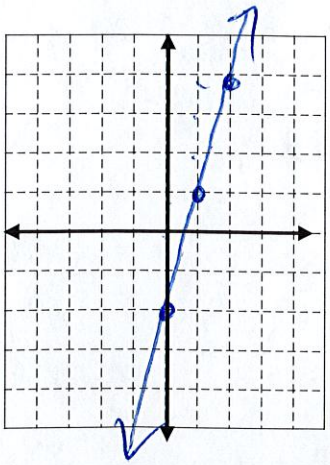
$\frac{-3 - (-1)}{6 - (2)} = \frac{-2}{4}$

Ex: (1,-3) and (-2,0)

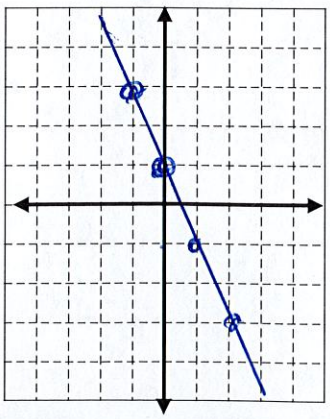
$\frac{0 - (-3)}{-2 - (1)} = \frac{3}{-3} = \frac{-1}{1}$

Graph $y = mx + b$ m = slope (rate of change) b = y – intercept (where we cross the y-axis)

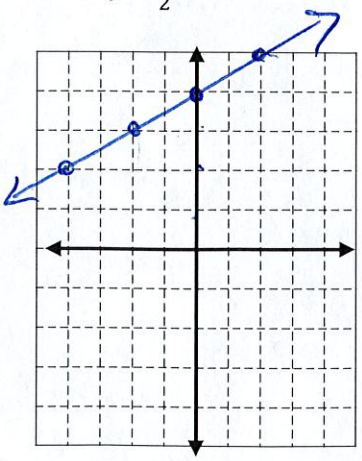
1. $y = 3x - 2$



2. $y = -2x + 1$



3. $y = \frac{1}{2}x + 4$



Find the slope using the Slope Formula: $m = \frac{y2-y1}{x2-x1}$

1. (2, 6) and (4, 8)

$\frac{8-6}{4-2} = \frac{2}{2}$

2. (4, -1) and (6, -3)

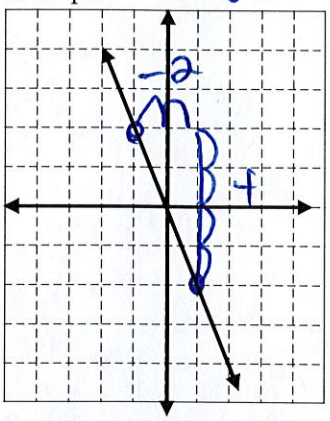
$\frac{-3-(-1)}{6-(4)} = \frac{-2}{2}$

3. (-1, 3) and (-2, 0)

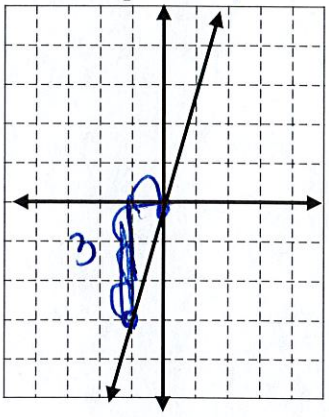
$\frac{0-(3)}{-2-(-1)} = \frac{-3}{-1} = \frac{3}{1}$

Find the slope of the given line.

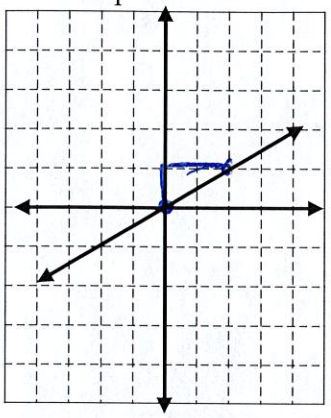
4. slope = $4/-2$



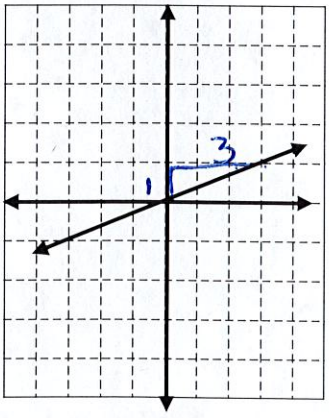
5. slope = $\frac{3}{1}$



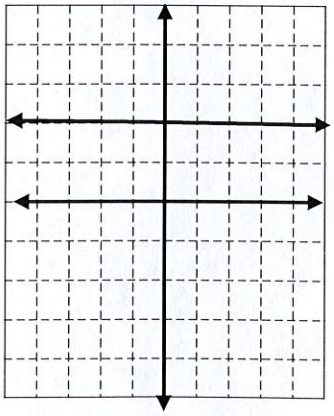
6. slope = $1/2$



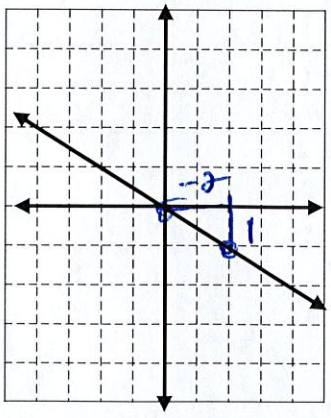
7. slope = $1/3$



8. slope = 0



9. slope = $-1/2$



10. If $g(x) = 3x + 1$

Find: $g(2) = 3(2)+1 = 7$

$g(-1) = 3(-1)+1 = -2$

11. $f(x) = 2x - 4$

$f(-1) = 2(-1)-4 = -6$

$f(4) = 2(4)-4 = 4$

12. $p(x) = -3x - 1$

$p(-2) = -3(-2)-1 = 5$

$p(3) = -3(3)-1 = -10$