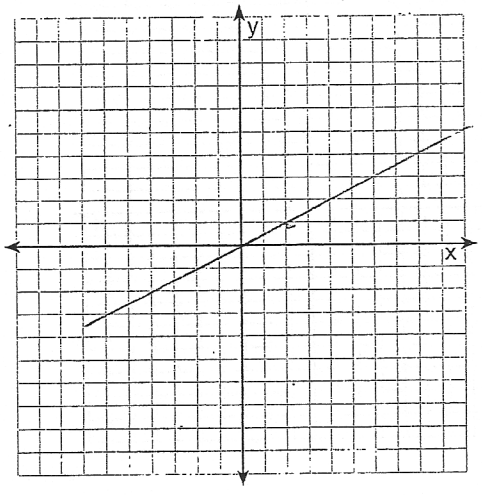
Name _____ Period _____

Proportionality

- Two quantities "x" and "y" show direct variation (or proportionality) when $y = kx$ (where "k" is a number and $k \neq 0$)
- The graph of $y = kx$ is a line that passes through the origin.

Direct Variation

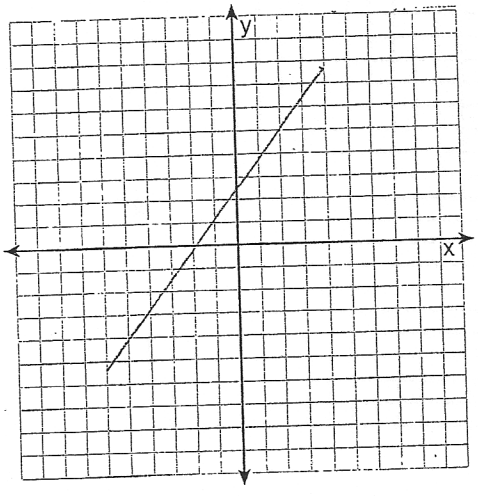
A graph that is directly proportional :



The line passes through the origin (0,0). So x and y show direct variation. In other words, "x" and "y" are directly proportional.

Indirect Variation

A graph that is not directly proportional :



The line does not pass through the origin (0,0). So x and y do not show direct variation. In other words, "x" and "y" are not directly proportional.

Direct Variation

A table that <u>is</u> directly proportional :

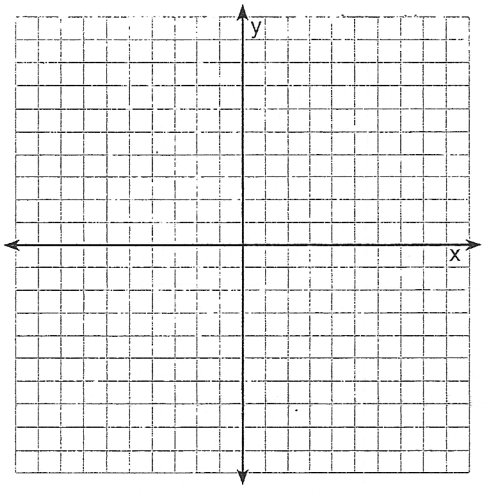
x	0	1	2	3
y	0	2	4	6

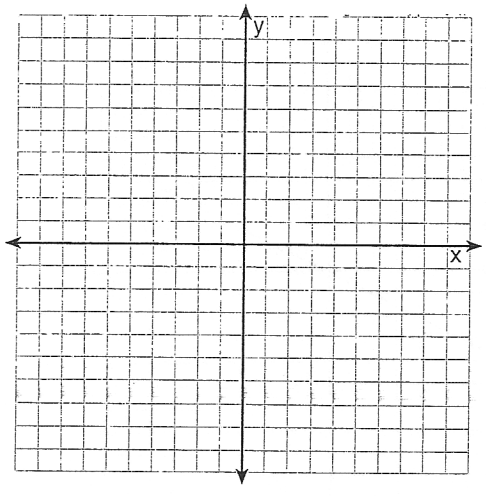
Indirect Variation

A table that <u>is not</u> directly proportional :

x	1	2	3	4
y	3	5	7	9

Graph the table values.





Did the line pass through the origin on the coordinate plane?

YES or NO

YES or NO

Equations that <u>are</u> directly proportional :

$Y = 4x$

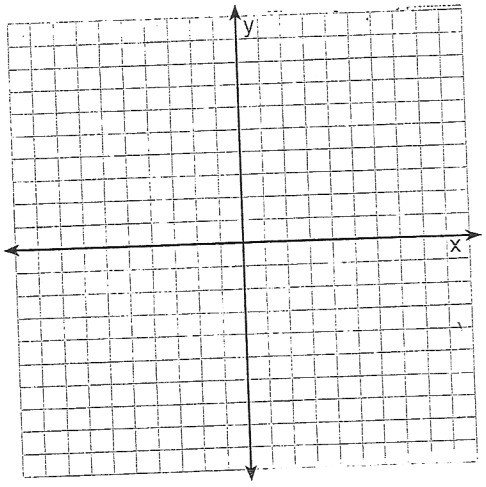
$Y = \frac{1}{2}x$

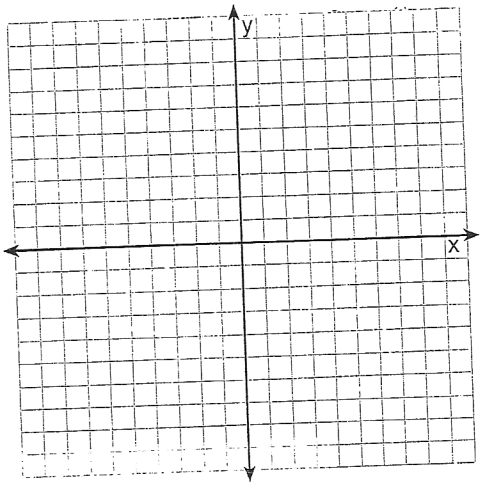
Equations that are not directly proportional :

$y = 4x + 1$

$y = \frac{1}{2}x - 3$

Graph the equations.





Did the lines pass through the origin on the coordinate plane?

YES or NO

YES or NO

- Although all the examples in these notes are graphs, tables, and equations that make straight lines, not all straight lines represent proportional relationships.
- **To be directly proportional, "y" must vary directly with "x" and it must pass through the origin (0,0) on the coordinate plane.**