

# Slope

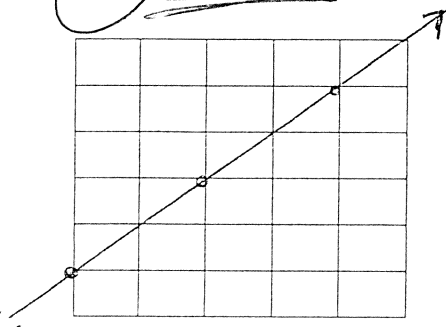
Key

#11

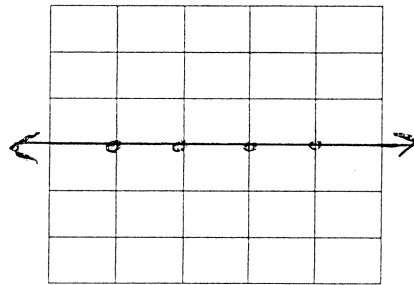
## ❖ Concept of slope

- As the "steepness" of a graph
- As the constant of proportionality, or the scale factor, or the unit rate
- As the coefficient,  $m$ , of  $x$  in the proportional relationship  $y = mx$
- As the  $\Delta Y / \Delta X$ ... The Greek symbol, delta ( $\Delta$ ), is used in algebra to denote the "change in"... so  $\Delta Y / \Delta X$  signifies, "change in  $y$  / change in  $x$ ."
- As the change in the dependent variable / change in the independent variable
- As the vertical change / horizontal change, or the "rise over the run"

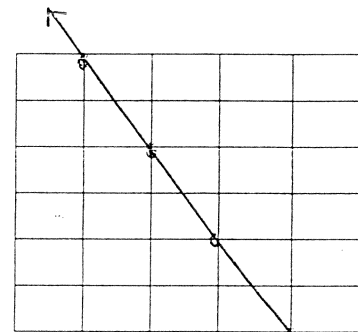
## ❖ Types of slope...



positive slope



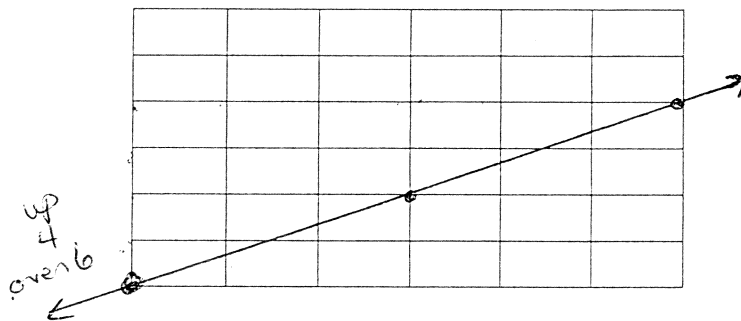
zero slope



negative slope

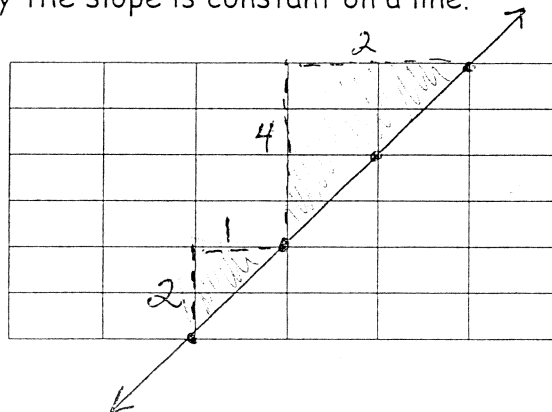
## ❖ How do we find the slope...

- Using rise/run on a graph?



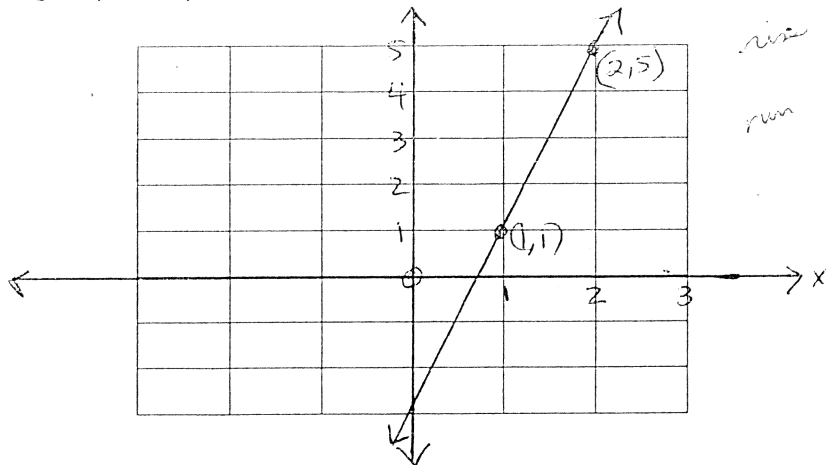
$$\text{slope} = \frac{4}{6} \text{ or } \left(\frac{2}{3}\right)$$

- Using similar triangles? Note: Similar triangles (and proportions) help us to explain why the slope is constant on a line.



$$\frac{2}{1} = \frac{4}{2} \checkmark$$

Using any two points on a non-vertical line...



rise  $\frac{5-1}{2-1} = \frac{4}{1} = 4$   
 run  
 or up 4, over 1  
 $\frac{4}{1} = 4$

- Using the amount the y values in the table change for each unit change in the x values

hours	distance
0	0
1	20
4	80

up 10  $\frac{20}{1} = 20$  ✓  
 $\frac{60}{3} = 20$  ✓

dozens	eggs
4	48
7	84
10	120

$\frac{36}{3} = 12$  ✓  
 $\frac{36}{3} = 12$

❖ How do we use the slope?

- To write the equation of a proportional relationship...  
 "The y value is twice as much as the x value."

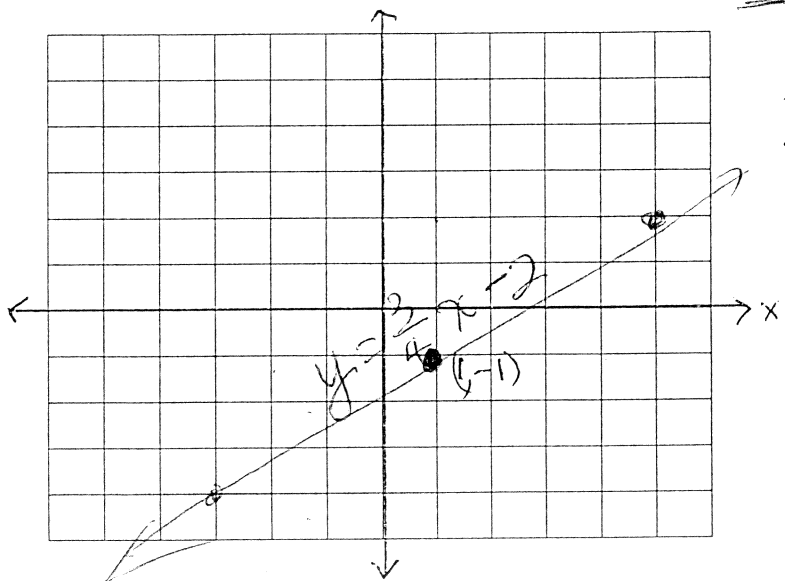
$y = 2x$

- To complete a table of values...

X	0	2	4	6	10	100	x
Y	0	6	12	18	30	300	3x

$\frac{6}{2} = 3$

- To graph a line knowing one point and the slope of the line.  
 "The line has a slope of  $\frac{3}{4}$  and goes through the point (1, -1)."



1st. Plot the point  
 2nd. then use the slope from that point to find more points!  
 3rd. connect the dots!