Mathematics 9

The Slope of a Line

Date:

Grid Lines: ***The vertical and*** horizontal ***lines which form the grid on graph paper.***

Grid Point: ***Any point of*** _____ ***of two*** _____ _____ ***on graph paper.***

Slope: ***A number which represents the*** _____ ***or*** _____ ***of a line.***

AMOUNT OF SLOPE:

Moderate Slope: .....makes an angle of _____ with the horizontal.

Gentle Slope: .....makes an angle between _____ and _____ with the horizontal.

Steep Slope: .....makes an angle between _____ and _____ with the horizontal.

Zero slope: .....makes an angle of _____ with the horizontal.

DIRECTION OF SLOPE: Lines many be ***vertical, horizontal, uphill*** or ***downhill*** in direction.

Uphill: ***Ascending,*** _____ ***or*** _____ ***to the right.***

Downhill: _____ , _____ ***or*** _____ ***to the right.***

Steps For Finding A Numerical Value For Slope:

1. Find two ***grid points*** on the line and mark them with dots.
2. Start at the left grid point.
3. Use a ruler to draw a horizontal line to the right from this point until you are vertically above or below the second grid point. This horizontal line is the ***run***.
4. Now draw a vertical line from the right end of the ***run*** either up or down to connect to the second grid point. This vertical line is the ***rise***.
5. Count the graph squares to determine the length of the ***run*** and the ***rise***.
6. The ***run*** is always positive.
7. The ***rise*** is positive if it is going upwards from the ***run***, or is negative if the ***rise*** is going downwards from the ***run***.
8. $$SLOPE = \frac{rise}{run}$$
9. Reduce the answer for slope to a fraction in lowest terms – avoid decimals or mixed numbers.

SUMMARY:

Uphill Slope:.....corresponds to slope values which are _____ .

Downhill Slope:.....corresponds to slope values which are _____ .

Moderate Slope: .....corresponds to a slope value of _____ or _____ .

Gentle Slope: .....corresponds to slope values which are _____ than _____.

Steep Slope: .....corresponds to slope values which are _____ than _____.

Zero slope: .....corresponds to a slope value of _____ .

Graph # ____ has the **steepest slope** of all because its slope value is _____.

Graph # ____ has the **gentlest slope** of all because its slope value is _____.

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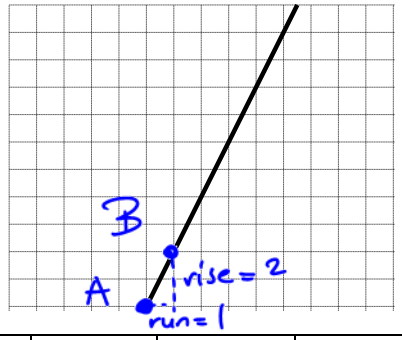
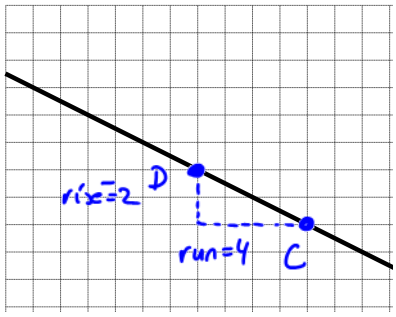
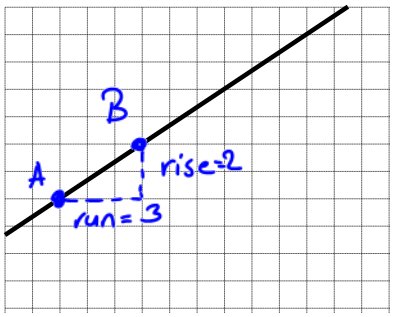


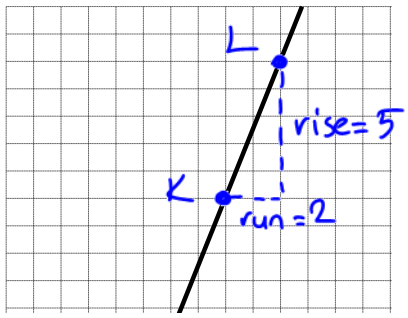
1.	amount of slope:	direction of slope:	slope =
	STEEP	UP (+)	$\frac{2}{1} = 2$



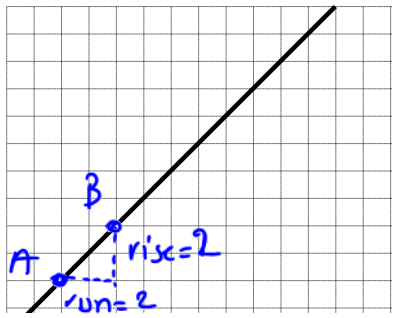
2.	amount of slope:	direction of slope:	slope =
	EXTREME	DOWN (−)	$\frac{-2}{4} = \frac{-1}{2} = -0.5$



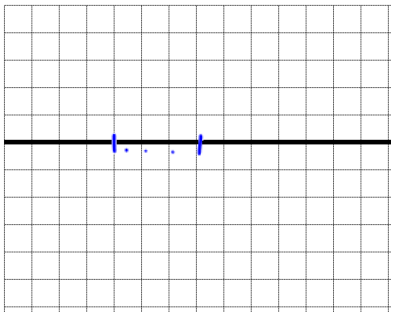
3.	amount of slope:	direction of slope:	slope =
	EXTREME	UP (+)	$\frac{2}{3} = 0.67$



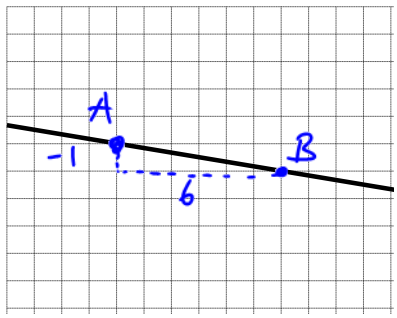
4.	amount of slope:	direction of slope:	slope =
	STEEP	UP (+)	$\frac{5}{2} = 2.5$



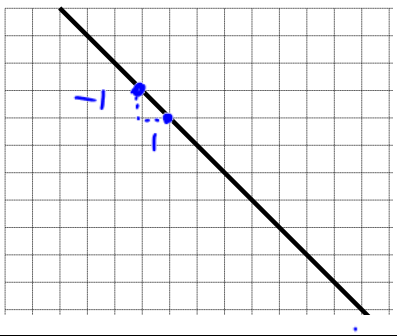
5.	amount of slope:	direction of slope:	slope =
	STEEP	UP (+)	$\frac{2}{2} = 1$



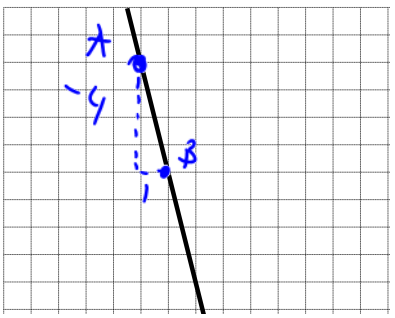
6.	amount of slope:	direction of slope:	slope =
	ZERO		$\frac{0}{3} = 0$



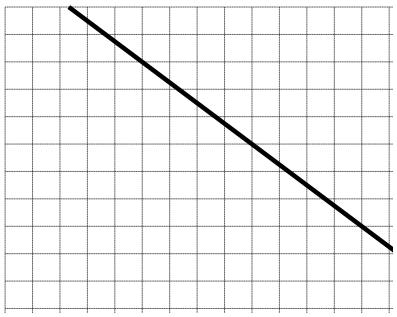
7.	amount of slope:	direction of slope:	slope =
	STRONG	DOWN	$\frac{-1}{6} = -0.17$

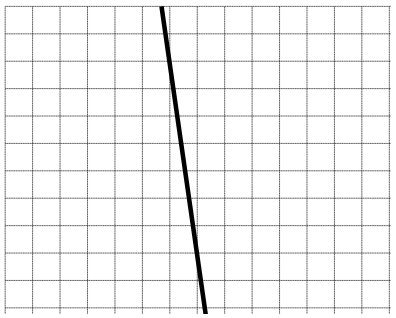


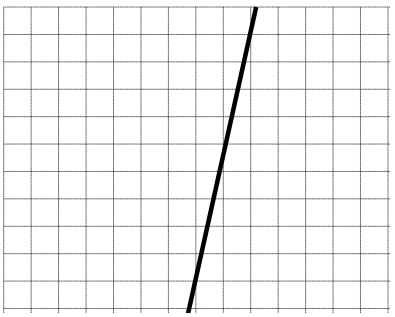
8.	amount of slope:	direction of slope:	slope =
	STEEP	DOWN	$\frac{-1}{1} = -1$



9.	amount of slope:	direction of slope:	slope =
	STEEP	DOWN	$\frac{-4}{1} = -4$







① For each of the slopes given in the table below:

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Point-Slope Graphs

Date:

a) Complete the rows for ***amount of slope*** and ***direction of slope*** in words.

b) Give the ***rise*** and the ***run*** in the spaces provided.

Graph #:	***1***	***2***	***3***	***4***	***5***	***6***
Slope	$\frac{4}{5}$:09	$\frac{5}{2}$	$-\frac{5}{3}$	$-\frac{1}{3}$	4	–3
Direction Of Slope	UP	UP	DOWN	DOWN	UP	DOWN
Amount Of Slope	STEEP	STEEP	STEEP	STEEP	STEEP	STEEP
Run *(always positive)*	5	2	3	3	1	1
Rise *(positive or negative)*	4	5	-5	-1	4	-3

② On the 6 graphs below, plot lines which pass through the origin that have the given slopes.

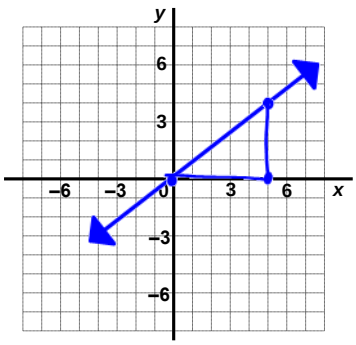
Steps:

i) Place your pencil at the requested starting point.

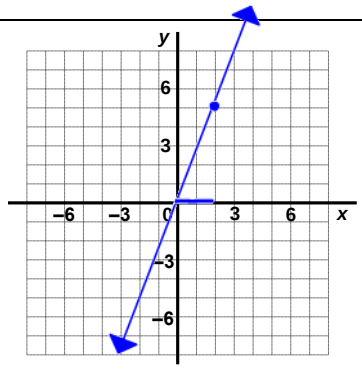
ii) Use a ruler draw the ***run first***. Since this is always positive, it will always be drawn to the right from the starting point.

iii) Now ***draw the rise*** from the end of the run. (***Up*** if positive, ***down*** if negative.)

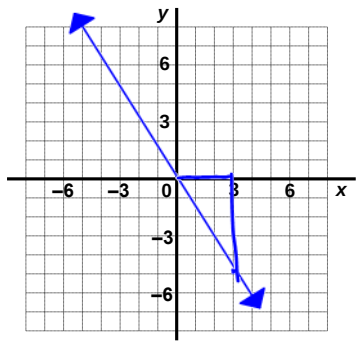
iv) Draw a line through the ends of the rise and run and ***extend the line to the edges of the grid.***



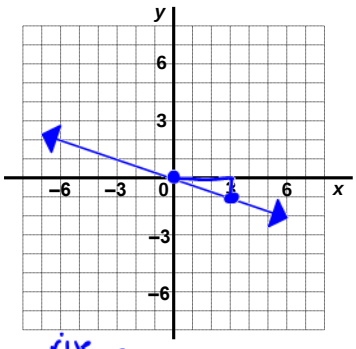
1. slope $= \frac{4}{5}$; start at (0,0)



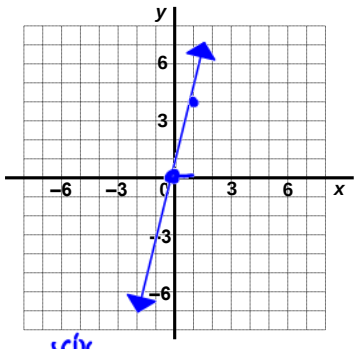
2. slope $= \frac{5}{2}$; start at (0,0)



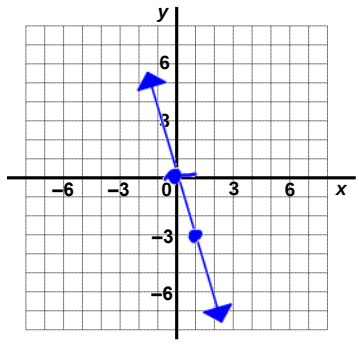
3. slope $= -\frac{5}{3}$; start at (0,0)



4. slope $= -\frac{1}{3}$; start at (0,0)



5. slope $= \frac{4}{1}$; start at (0,0)



6. slope $= \frac{-3}{1}$; start at (0,0)

For the remaining graphs notice that the requested start point for the *run* is no longer at the origin.

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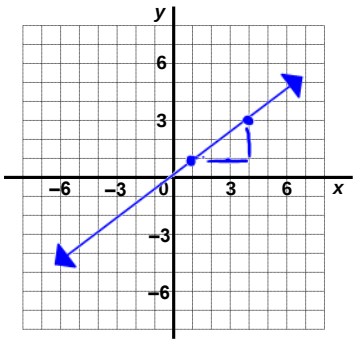
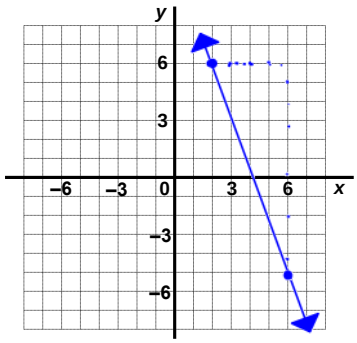
Point-Slope Graphs

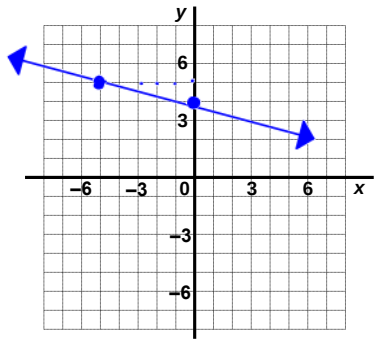
Date:



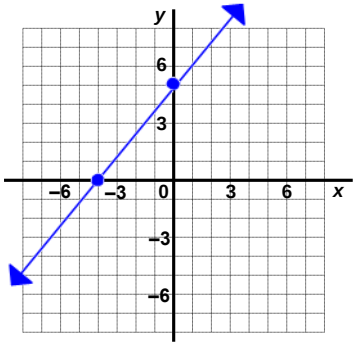
7. slope $= \frac{2}{3}$; start at (1,1)



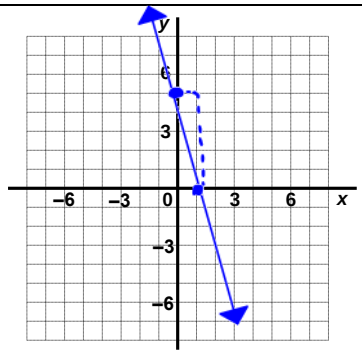
8. slope $= -\frac{11}{4}$; start at (2,6)



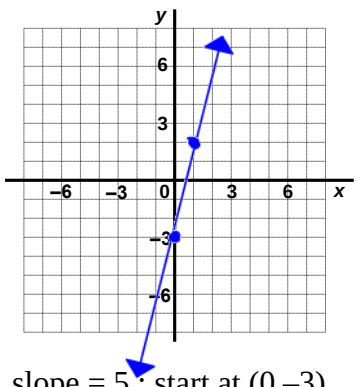
9. slope $= -\frac{1}{5}$; start at (–5,5)



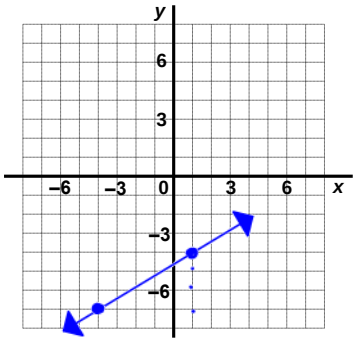
10. slope $= \frac{5}{4}$; start at (–4,0)



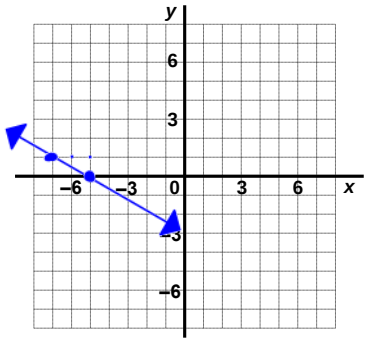
11. slope = –6 ; start at (0,5)



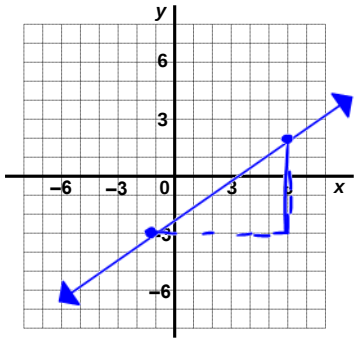
12. slope = 5 ; start at (0,–3)



13. slope $= \frac{3}{5}$; start at (–4,–7)



14. slope $= -\frac{1}{2}$; start at (–7,1)



15. slope $= \frac{5}{7}$; start at (–1,–3)

To Check Answers:

If drawn correctly, your line will also go through the point indicated below. ***(A near miss probably means that you just need to be more careful when lining up your ruler to draw the line—try it!)***

1. (–5,–4)
2. (–2,–5)
3. (–3,5)
4. (–6,2)
5. (2,8)
6. (–1,3)
7. (7,5)
8. (6,–5)
9. (5,3)
10. (–8,–5)
11. (2,–7)
12. (–1,–8)
13. (6,–1)
14. (1,–3)
15. (–8,–8)