UNIVERSIDAD TECNOLÓGICA DE

SAN LUIS RIO COLORADO

2.2.3 | 2.2.4

MTRO. ANOLDO DELGADO GONZALEZ

AUTOR: VICTOR MANUEL GALVAN COVARRUBIAS

San Luis Rio Colorado, Sonora Junio, 2020

2.2.3 Slope of a line HW4 10%

Slope of a line (Coordinate Geometry)

Definition: The slope of a line is a number that measures its "steepness", usually denoted by the letter m. It is the change in y for a unit change in x along the line.

Slope direction

The slope of a line can positive, negative, zero or undefined.

Positive slope

Here, y increases as x increases, so the line slopes upwards to the right. The slope will be a positive number. The line on the right has a slope of about +0.3, it goes up about 0.3 for every step of 1 along the x-axis.

Negative slope

Here, y decreses as x increases, so the line slopes downwards to the right. The slope will be a negative number. The line on the right has a slope of about +0.3, it goes up about 0.3 for every step of 1 along the x-axis.

Zero slope

Here, y does not change as x increases, so the line in exactly horizontal. The slope of any horizontal line is always zero. The line on the right goes neither up nor down as x increases, so its slope is zero.

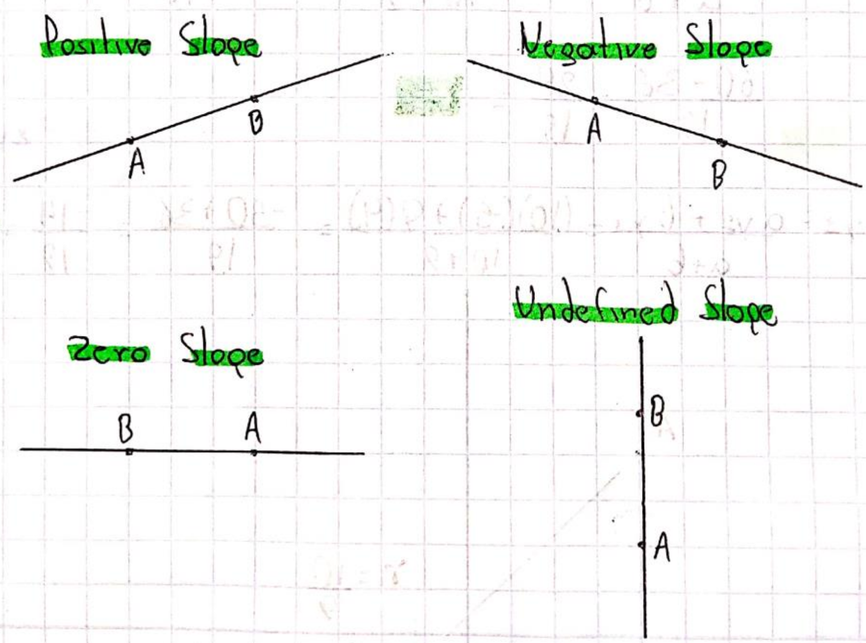
Undefined slope

When the line is exactly vertical, it does not have a defined slope. The two x coordinates are the same, so the difference is zero. The slope calculation is then something like.

$$\text{slope} = \frac{21}{0}$$

When you divide anything by zero the result has no meaning. The line above is exactly vertical, so it has no defined slope. We say "the slope of the line AB is undefined".

A vertical line has an equation of the form $x = a$, where a is the x intercept. For more on this see Slope of a vertical line.



2.2.4 Portioning a segment in a given ratio HWS 10%

What are the coordinates of the point c that divides the direct line segments:

1 Segment AB in the Ratio 2:3, if A(-4,4) and B(6,-5)

- Assing variables
- Formula procedure
- Graph

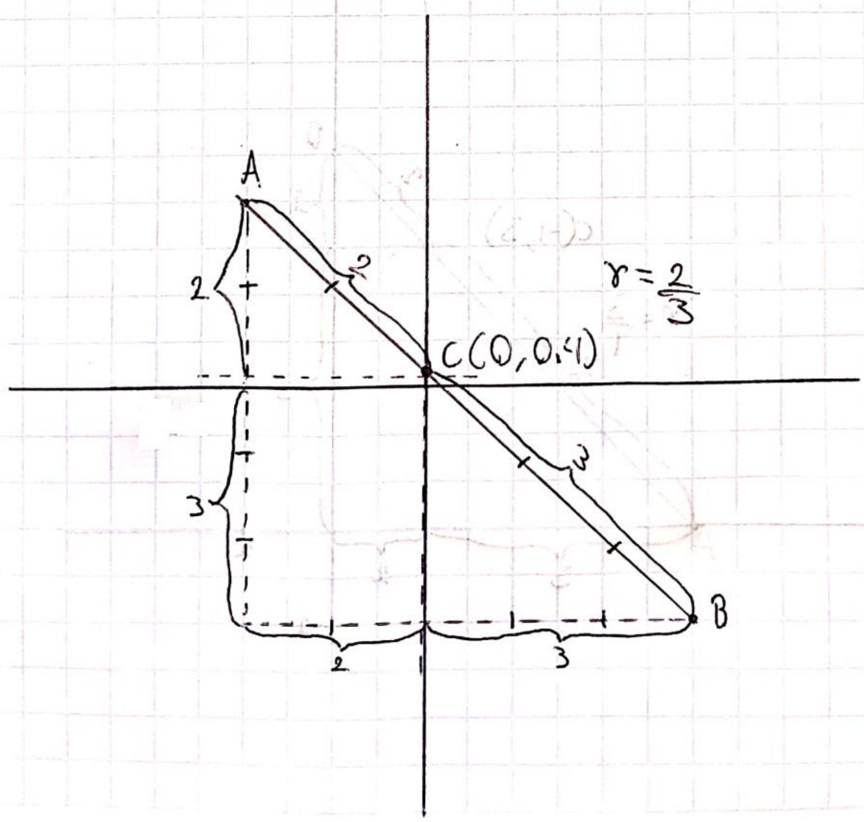
$A(-4,4)$ $B(6,-5)$ $C(0,0.4)$

$x_1\ y_1$ $x_2\ y_2$ $x_3\ y_3$

$r = \frac{2}{3} = \frac{a}{b}$

$Cx_3 = \frac{ax_2 + bx_1}{a+b} = \frac{(2)(6)+3(-4)}{2+3} = \frac{12+(-12)}{5} = \frac{0}{5} = 0$

$Cy_3 = \frac{ay_2 + by_1}{a+b} = \frac{(2)(-5)+3(4)}{2+3} = \frac{-10+12}{5} = \frac{2}{5} = 0.4$



2 Segment AB in the Ratio 3:1, if A(-4,0) and B(0,4)

- Assing variables
- Formula procedure
- Graph

$A(-4,0)$ $B(0,4)$ $C(-1, 3)$

$x_1\ y_1$ $x_2\ y_2$ $x_3\ y_3$

$r = \frac{3}{1} = \frac{a}{b}$ $Cx_3 = \frac{ax_2 + bx_1}{a+b} = \frac{(3)(0) + 1(-4)}{3+1} = \frac{0-4}{4} = \frac{-4}{4} = -1$

$Cy_3 = \frac{ay_2 + by_1}{a+b} = \frac{(3)(4) + 1(0)}{3+1} = \frac{12+0}{4} = \frac{12}{4} = 3$