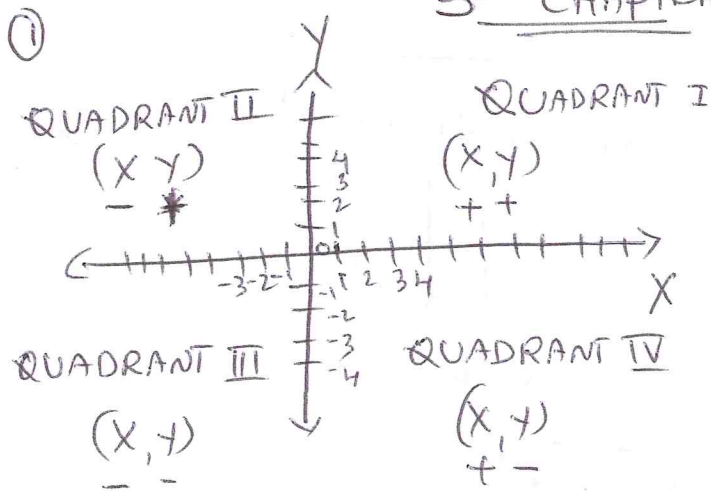


### 3<sup>RD</sup> CHAPTER: NOTES     ALG: 3



② A RELATION IS ANY SET OF ORDERED PAIRS:  $\{(1,3), (2,5), (2,6), (4,7)\}$

③ A FUNCTION IS A SET OF ORDERED PAIRS IN WHICH NO TWO ORDERED PAIRS HAVE THE SAME FIRST COORDINATE.  $\{(2,3), (3,4), (5,7), (6,8)\}$

④ DOMAIN: - THE SET OF ALL FIRST CO-ORDINATES:  $\{2, 3, 5, 6\}$

⑤ RANGE: - THE SET OF ALL SECOND CO-ORDINATES:  $\{3, 4, 7, 8\}$

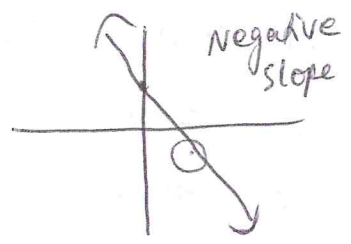
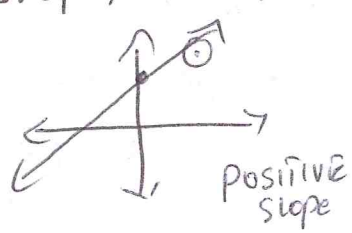
⑥ FUNCTION NOTATION: -  $y = 2x + 4$ , OR  $f(x) = 2x + 4$ .

X IS CALLED INDEPENDANT VARIABLE, Y IS CALLED DEPENDANT VARIABLE.

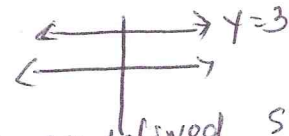
⑦ GRAPH: - LINEAR FUNCTION:  $y = mx + b$ ;  $f(x) = -\frac{1}{2}x + 2$

THE POINT AT WHICH THE GRAPH CROSSES THE X-AXIS IS CALLED X-INTERCEPT, AND THE POINT AT WHICH A GRAPH CROSSES THE Y-AXIS IS CALLED THE Y-INTERCEPT.

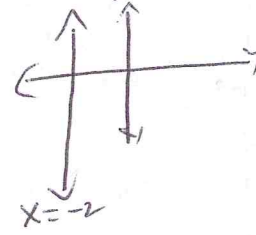
⑧ SLOPE: - Slope is represented by M. If  $y = 2x + 3$ , then the line has a positive slope, and if  $y = -3x + 2$ , then the line has a negative slope.



9)  $y=3$  IS A HORIZONTAL LINE has ZERO Slope.



10)  $x=-2$  IS A VERTICAL LINE, has undefined slope.

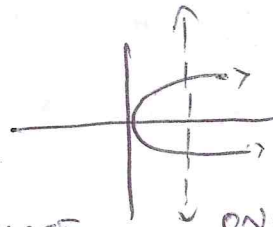


11) DISTANCE FORMULA:  $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$   
 $(x_1, y_1) = (2, 4)$ ;  $(x_2, y_2) = (-3, 5)$ :  $d = \sqrt{(-3-2)^2 + (5-4)^2} = \sqrt{25+1} = \sqrt{26}$

12) MID-POINT FORMULA:  $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$ ;  $(x_1, y_1) = (2, 3)$ ,  $(x_2, y_2) = (4, 6)$   
 $\left(\frac{2+4}{2}, \frac{3+6}{2}\right) = (3, 4.5)$

13) THE AVERAGE RATE OF CHANGE: -  $\frac{\text{CHANGE IN } Y}{\text{CHANGE IN } X}$

14) VERTICAL LINE TEST



IF Every vertical line INTERSECTS A Graph at MOST ONCE, Then the graph IS the graph of A Function:-

15) X-INTERCEPT:-  $3x + 4y = 12$ ; PUT  $y=0$  GET  $3x = 12$  |  $x=4$  |  $(4, 0)$   
 Y-INTERCEPT:-  $3x + 4y = 12$ ; PUT  $x=0$  GET  $4y = 12$  |  $y=3$  |  $(0, 3)$

16) Slope  $m = \frac{y_2 - y_1}{x_2 - x_1}$ ;  $(x_1, y_1) = (-3, 2)$ ;  $(x_2, y_2) = (1, 4)$ :  $m = \frac{4-2}{1-(-3)} = \frac{1}{2}$

17) Slope-INTERCEPT FORM:  $y = mx + b$ ;  $m = \text{slope}$ ;  $b = \text{Y-INTERCEPT}$

18) PARALLEL LINES:- slopes ARE EQUAL;  $m_1 = m_2$

19) PERPENDICULAR LINES:- RECIPROCAL NEGATIVE slopes  
 $m_1 = 2$ ;  $m_2 = -1/2$  ( $m_1 \cdot m_2 = -1$ )