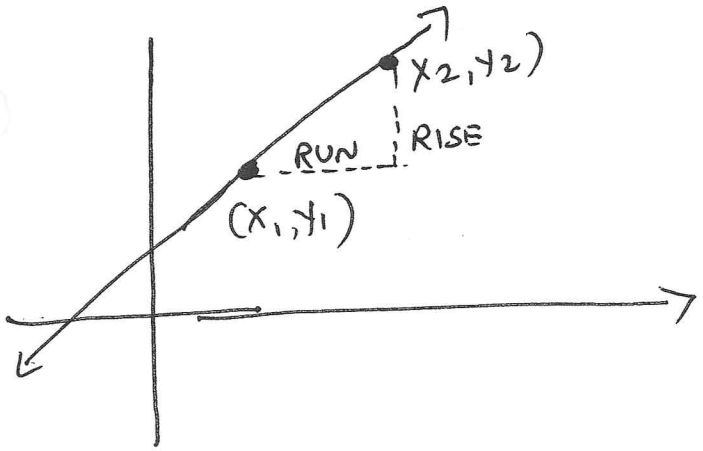
3.4. SLOPES OF LINES:- MR. REDDY'S NOTES:-

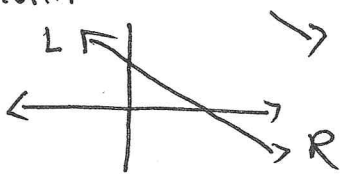
① 

IF A LINE PASSES THROUGH (x_1, y_1) AND (x_2, y_2) THEN THE SLOPE

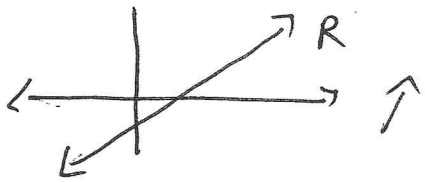
$$M = \frac{\text{RISE}}{\text{RUN}} = \frac{\text{Change in } y}{\text{Change in } x}$$

$$= \frac{y_2 - y_1}{x_2 - x_1}$$

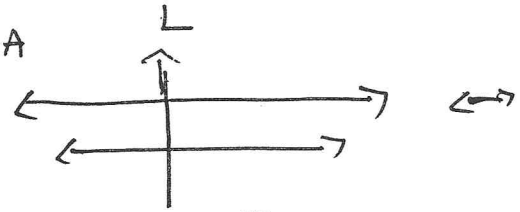
② NEGATIVE SLOPE:- FALLS FROM LEFT TO RIGHT.



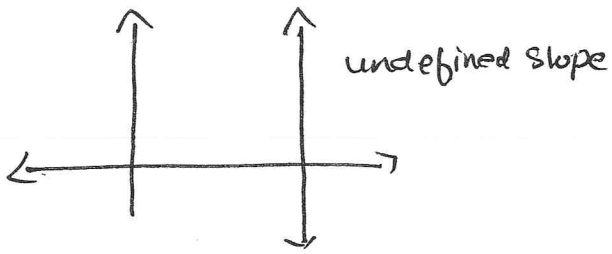
③ POSITIVE SLOPE:- RISES FROM LEFT TO RIGHT.



④ ZERO SLOPE HORIZONTAL LINE HAS A SLOPE ZERO.

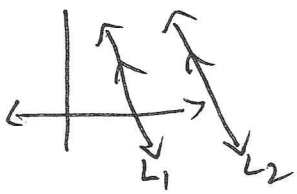


⑤ Undefined slope:- VERTICAL LINE HAS Undefined SLOPE



⑤ PARALLEL LINES:- Slopes are equal.

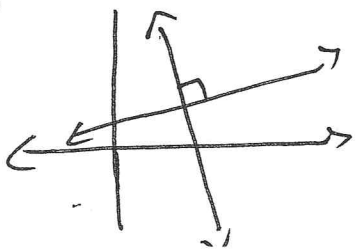
$$M_1 = M_2$$



⑥ perpendicular lines:- product of slopes equals -1.

$$M_1 \cdot M_2 = -1$$

$$\boxed{M_1 = -1} \text{ OR}$$



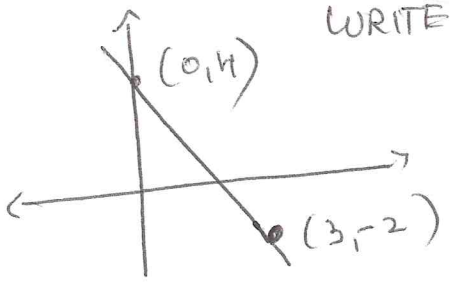
3.5. WRITE AND GRAPH EQUATIONS OF LINES: MR. REDDY'S

1) SLOPE-INTERCEPT FORM $y = mx + b$.

m = SLOPE $= \frac{y_2 - y_1}{x_2 - x_1}$

b = y- INTERCEPT, WHERE THE LINE CUTS y-AXIS.

EX ① WRITE AN Equation of a line from the graph



① $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - -2}{0 - 3} = \frac{6}{-3} = -2$

② y-INTERCEPT $b = 4$

③ $y = mx + b = -2x + 4$

$\boxed{y = -2x + 4}$

---

② EQUATION OF A PARALLEL LINE:

WRITE AN EQUATION OF THE LINE PASSING THROUGH the point $(-1, 1)$ and is parallel to the equation $y = 2x - 3$.

STEP ① slope $m = 2$ (same as the given slope)

STEP ② point $(x, y) = (-1, 1)$

STEP ③ $y = mx + b$; $1 = 2(-1) + b$

$1 = -2 + b$

$2 \quad 2$

$\boxed{3 = b}$

$\boxed{y = 2x + 3}$

---

(3) WRITE AN EQUATION OF A perpendicular line

PROBLEM:- WRITE AN EQUATION OF THE LINE PASSING THROUGH THE POINT $(2,3)$ AND IS PERPENDICULAR TO ANOTHER LINE

$Y = -2X+2$ ✓

SOLUTION: STEP (1) slope of the line given -2

M = Negative reciprocal of the given slope $\frac{1}{2}$

STEP (2) POINT $(2,3)$

STEP (3) $Y = MX+B$

$3 = \frac{1}{2} \cdot 2 + B$

$\boxed{3 = B}$

$\boxed{Y = \frac{1}{2}X + 3}$

---

(4) GRAPH A LINE WITH EQUATION IN STANDARD-FORM

PROBLEM:- $3X+4Y=12$

STEP (1)

FIND X-INTERCEPT:

PUT $Y=0$

$\frac{3X+0}{3} = \frac{12}{3}$

$\boxed{X=4}$ $(4,0)$ ✓

STEP (2)

FIND Y-INTERCEPT

PUT $X=0$

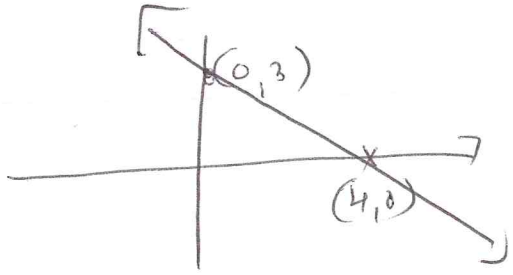
$3X+4Y=12$

$0+\frac{4Y}{4} = \frac{12}{4}$

$\boxed{Y=3}$ $(0,3)$ ✓

STEP (3)

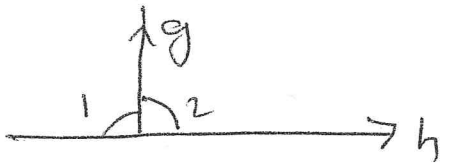
Graph:



MR-REDDY'S NOTES 3.6 PERPENDICULAR LINES

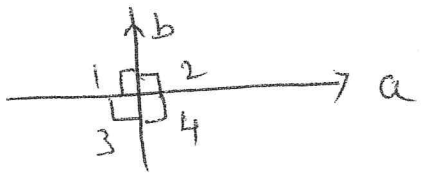
1) IF TWO LINES INTERSECT TO FORM A LINEAR PAIR OF CONGRUENT ANGLES, THEN THE LINES ARE PERPENDICULAR.

IF $\angle 1 \cong \angle 2$, then $g \perp h$



(2) IF TWO LINES ARE PERPENDICULAR, then they INTERSECT TO FORM FOUR RIGHT angles.

IF $a \perp b$, then $\angle 1$, $\angle 2$, $\angle 3$, $\angle 4$ are right angles



(3) IF TWO SIDES of two adjacent acute angles are $\perp$ ar, then the angles are complementary:

IF $\overrightarrow{BA} \perp \overrightarrow{Bc}$ then $\angle$ and $\angle$ are Complementary.