Subject 1 موضوع الدرس | Date التاريخ

Equation of straight line

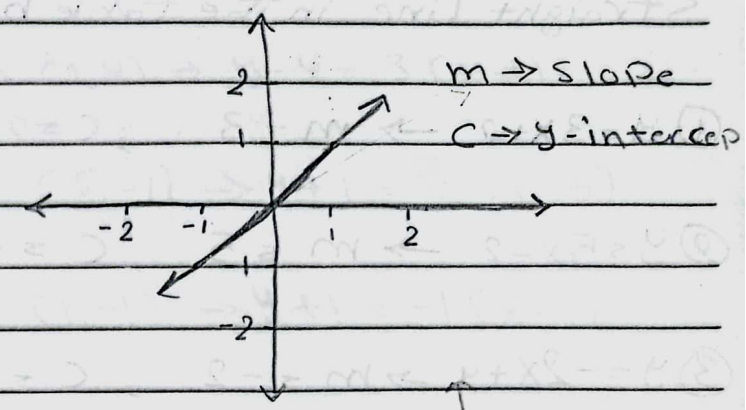
$y = mx + c$

$m \rightarrow$ slope

$c \rightarrow$ y-intercep

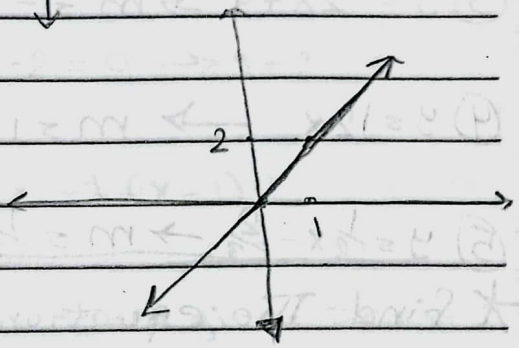
* $y = x$

y	x
0	0
-1	-1
1	1



* $y = 2x$

y	x
0	0
1	2
-1	-2



(1) The equation of straight line which the orgin is equal

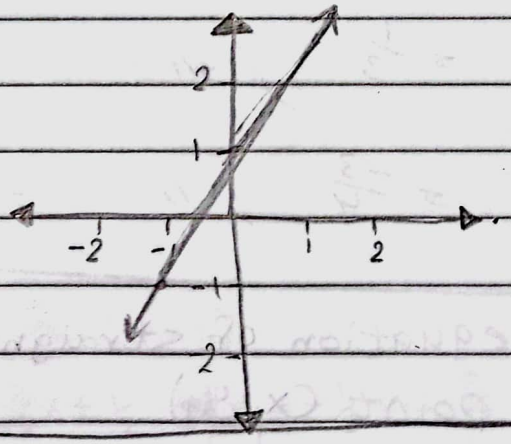
① $y = mx$ ② $y = mx + c$ ③ $y = m(x - x_1)$ ④ None

(2) The y-intercept of aline

$y = 2x + 1$

X	y
0	1
1	3
-1	-1

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



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★ Determine the slope and y-intercept for each of the straight line in the table below

① $y = 3x + 2 \rightarrow m = 3 \;, c = 2$

② $y = 5x - 2 \rightarrow m = 5 \;, c = -2$

③ $y = -2x + 4 \rightarrow m = -2 \;, c = 4$

④ $y = 12x \rightarrow m = 12 \;, c = 0$

⑤ $y = \frac{1}{2}x - \frac{2}{3} \rightarrow m = \frac{1}{2} \;, c = -\frac{2}{3}$

*$2y - 10x = 8$

$2y = 10x + 8$

$y = 5x + 4$

$m = 5$

★ Find the equation of the line described

① gradient = 5 , y-intersept = 3 $\rightarrow y = 5x + 3$

② // = -2 , // = -1 $\rightarrow y = -2x - 1$

③ // = 3 , Passing Throught the orgin $\rightarrow y = 3x \;, c = 0$

④ // = $\frac{1}{3}$, // // $(0, 1) \rightarrow y = \frac{1}{3}x + 1 \;, c = 1$

⑤ // = $\frac{-3}{4}$, // = $\frac{1}{2}$ $\rightarrow y = -\frac{3}{4}x + \frac{1}{2} \;, c = \frac{1}{2}$

★ The equation of straight line with given slope passing throu a given point (x_1, y_1)

$$y - y_1 = m(x - x_1)$$

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★ Find The equation of Thelines described below

① Slope = 3 , Passing Through (1,4) → $y-4=3(x-1)$

② Slopes $\frac{2}{5}$, " " $(5,-1) \rightarrow y+1=\frac{2}{5}(x-5)$

③ " $=-1$ " " $(1,-1) \rightarrow y+1=-1(x-1)$

④ " $=0$ " " $(-1,2) \rightarrow y-2=0 \rightarrow y=2$

⑤ " $=-1$ " " $(1,-1) \rightarrow y+1=-1(x-1)$

4 The equation of a straigh line Through two given Points

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

(x_1,y_1) Pass The
(x_2,y_2) Straight Line

★ Find The equation of Straigh Line which passes Through The two Point (-1, 2) and (2,4) ?

$m=\frac{4-2}{2+1}=\frac{2}{3}$ $\quad y-2=\frac{2}{3}(x+1)$

★ two Point (1,-2) and (-3,0)

$m=\frac{0+2}{-3-1}=\frac{2}{-4}=-\frac{1}{2}$ $\quad y+2=-\frac{1}{2}(x-1)$

$y+2=-\frac{1}{2}x+\frac{1}{2} \rightarrow \boxed{y=-\frac{1}{2}x-\frac{3}{2}}$

$\boxed{C=-\frac{3}{2}}$

★ Find The equation of The lines described below

① Passing Throught (4,6) and (8,26) $= \frac{26-6}{8-4} = 5 \rightarrow y-6=5(x-4)$

② // // (3,4) // (5,4) $= \frac{4-4}{5-3} = \frac{0}{2} = 0 \rightarrow y-4=0 \rightarrow y=4$

③ // // (1,1) // (4,-8) $= \frac{-8-1}{4-1} = \frac{-9}{3} = -3 \rightarrow y-1=-3(x-1)$

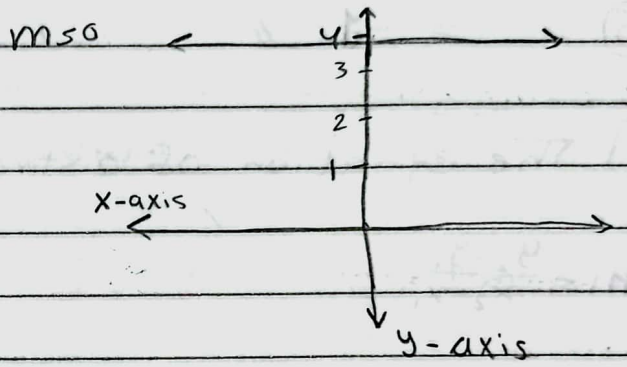
④ // // (0,2) // (4,0) $= \frac{0-2}{4-0} = \frac{-2}{4} = -\frac{1}{2} \rightarrow y-2=-\frac{1}{2}x$

$y=4$

$ax+by+c=0 \rightarrow y = \frac{-a}{b}x - \frac{c}{b}$

$a=0 \rightarrow$ horizontal St. line

$b=0 \rightarrow$ vertical St. line



★ Find The equation of line describe.

① The vertical line passing Throught The point $(0, \frac{2}{3}) \rightarrow b=0$

$ax+by+c=0$

$ax=-c$

$-c=0 \rightarrow \boxed{c=0}$

$ax=0 \rightarrow \boxed{x=0}$

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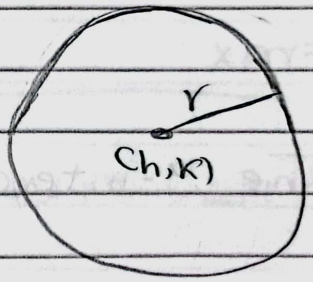
★ Circle

- A circle with center (h, K) and radius > 0 is the set of all points (x, y) in the plane where distance to (h, K) is r

$$r = \sqrt{(x-h)^2 + (y-K)^2}$$



★ The standard eq. of a circle of center (h, K) and $r > 0$ is $(x-h)^2 + (y-K)^2 = r^2$

EX. write the standard eq. of the circle with center (-2, 3) and radius = 5

$$(x+2)^2 + (y-3)^2 = 25$$

★ Graph $(x+2)^2 + (y-1)^2 = 4$ → find the center and radius

$h = -2$

$K = 1$ → $(h, K) = (-2, 1)$, $r = 2$