

MATH 2 ASSIGNMENT 1

① sketch the graph of the equation by point plotting

$$y = -\frac{1}{5}x + 2$$

$$\therefore (2, 0) (0, 2\frac{2}{5})$$

coordinates:

$$x\text{-axis} = -\frac{1}{5}(0) + 2$$

$$= 2$$

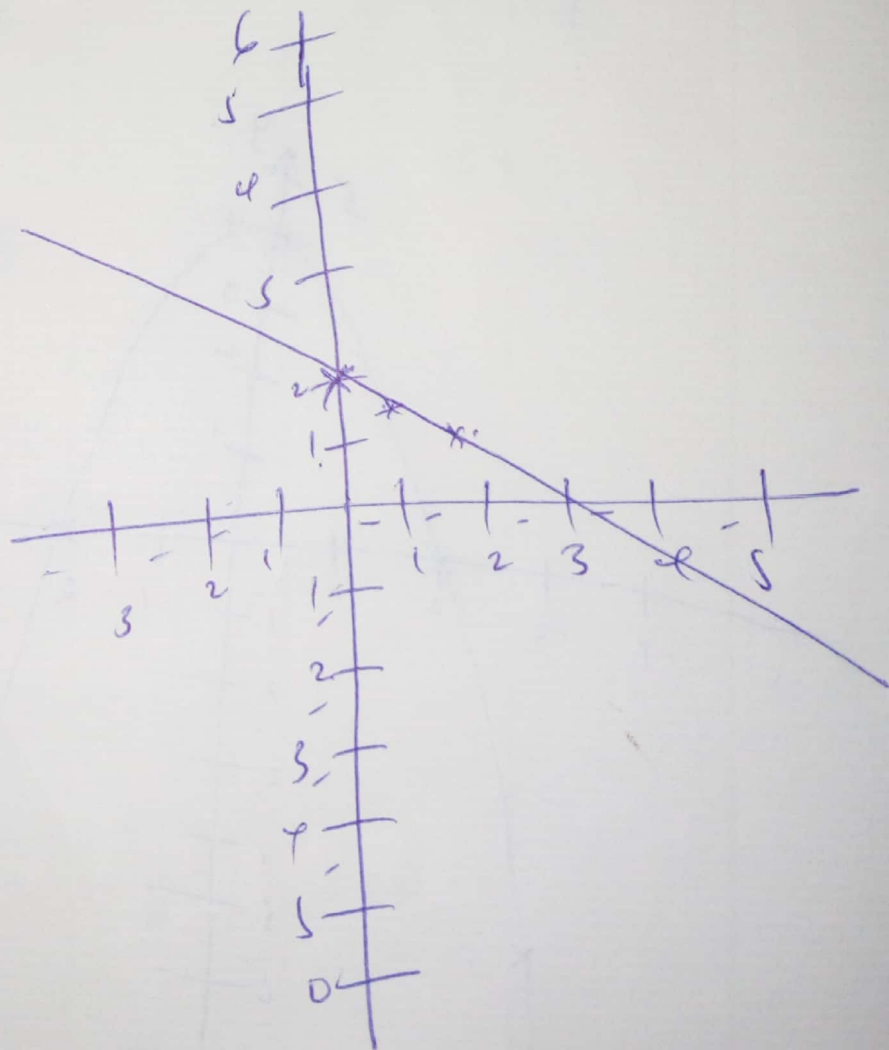
$$y\text{ intercept} = \frac{1}{5}(2) + 2$$

$$= \frac{2}{5} + 2$$

$$y = 2\frac{2}{5}$$

$$(2, 2\frac{2}{5})$$

x	0	1	2
y	2	$2\frac{1}{5}$	$2\frac{2}{5}$

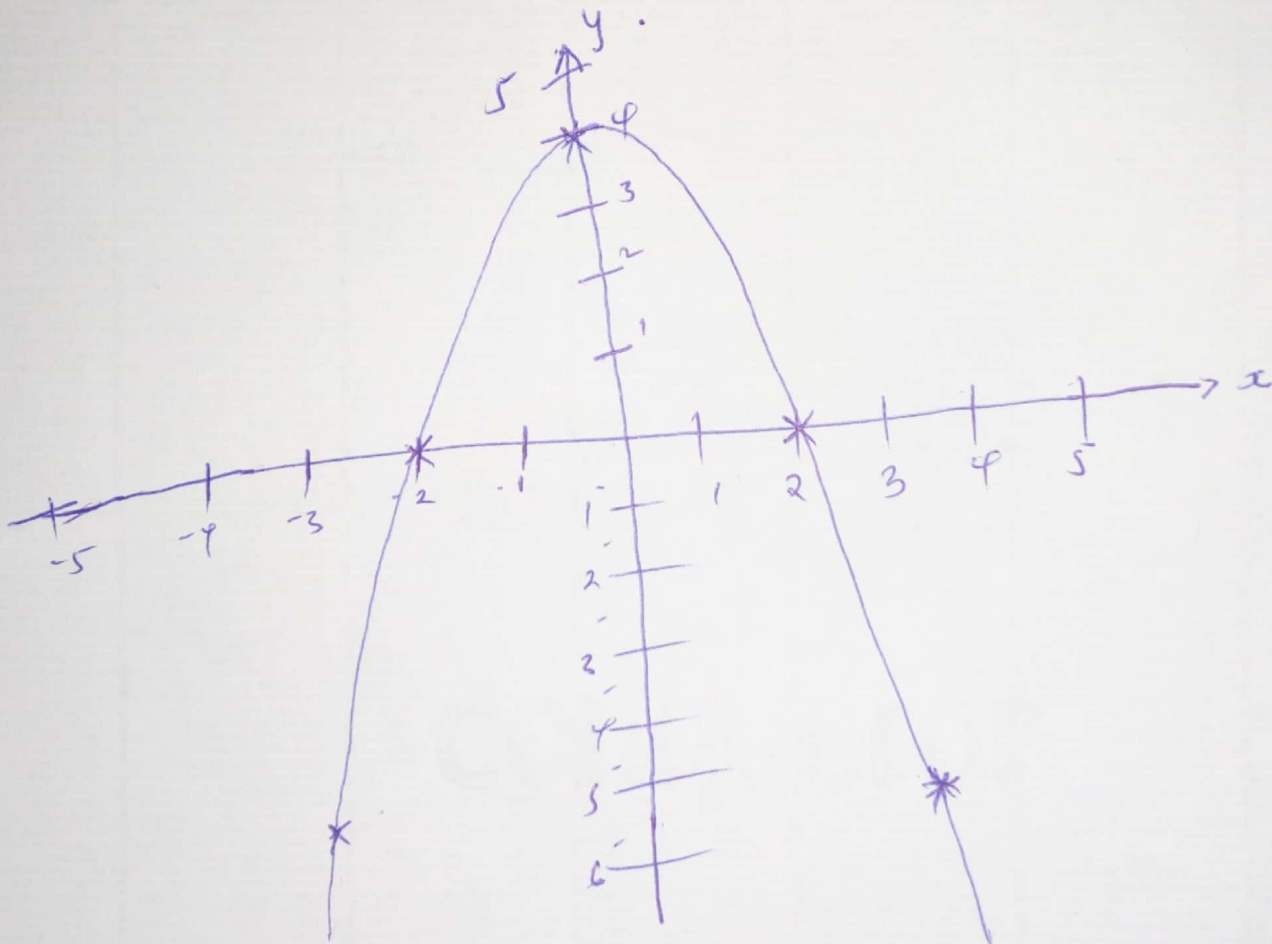


Our Ref:

Your Ref:

② sketch the graph of the equation by point plotting
 $y = 4 - x^2$

x	-3	-2	0	2	3
y	-5	0	4	0	-5



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③ Find any intercepts.

$$y = x^2 + 8x - 9$$

$$0 = x^2 + 8x - 9$$

$$x = -9, -1$$

$$y \text{ intercept } y = (0)^2 + 8(0) - 9$$

$$y = -9$$

$$y = x^2 + 8x - 9$$

$$x \text{ intercept } = (9, 0) ; (-1, 0)$$

$$y \text{ intercept } : (0, -9)$$

④ Find any intercepts.

$$y = 3x - x^2$$

$$y = 3x - 3x^2$$

$$y = 3x(1-x)$$

$$1-x = 0$$

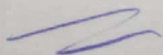
$$\underline{x = 1}$$

$$3x = 0$$

$$\underline{x = 0}$$

$$x \text{ intercept } (1, 0) (3, 0)$$

$$y \text{ intercept } = (0, 3)$$



Our Ref:

Your Ref:

(5) sketch the lines.
(4, 3) (a) 2 b (-2) c (-3/2)

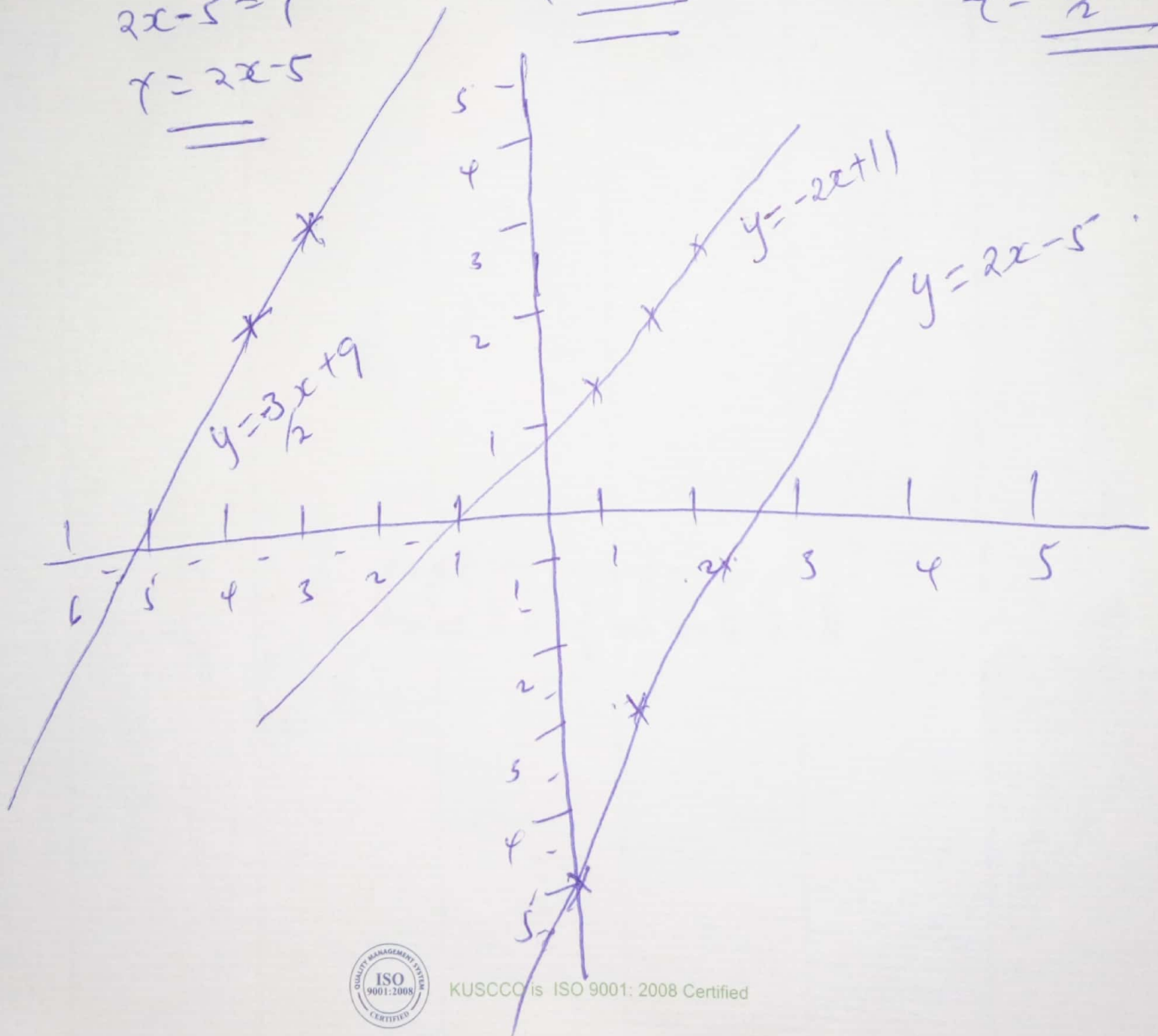
$$a) \quad 7 = \frac{7-3}{x-4}$$

$$\begin{aligned} 2(x-4) &= 7-3 \\ 2x-8 &= 7-3 \\ 2x-8+8 &= 7-3+8 \\ 2x-5 &= 7 \\ \underline{\underline{x &= 2x-5}} \end{aligned}$$

$$\begin{aligned} (b) \quad -2 &= \frac{7-3}{x-4} \\ -2(x-4) &= 7-3 \\ -2x+8 &= 7-3 \\ -2x+11 &= 7 \\ \underline{\underline{x &= -2x+11}} \end{aligned}$$

$$c) \quad -\frac{3}{2} = \frac{7-3}{x-4}$$

$$\begin{aligned} -\frac{3}{2}(x-4) &= 7-3 \\ -\frac{3}{2}x+6 &= 7-3 \\ -\frac{3}{2}x+9 &= 7 \\ \underline{\underline{x &= -\frac{3}{2}x+9}} \end{aligned}$$



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⑥ Find an equation of a line that passes through the point and has the indicated slope.

$$M = (-3, -6) \text{ } \frac{8}{3}$$

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

$$\frac{8}{3} = \frac{y + 6}{x + 3}$$

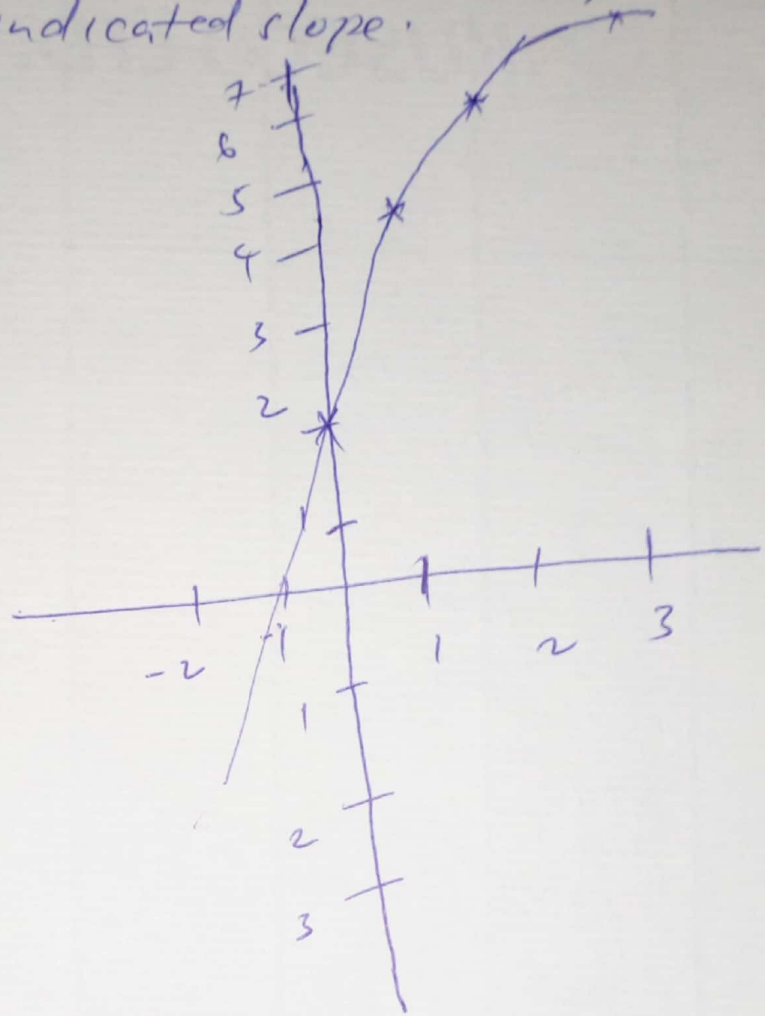
$$\frac{8}{3}(x + 3) = y + 6$$

$$\frac{8}{3}x + 8 = y + 6$$

$$\frac{8}{3}x + 8 - 6 = y$$

$$\frac{8}{3}x + 2 = y$$

$$y = \frac{8}{3}x + 2$$



$\frac{8}{3}$

x	-1	0	1	2	3
y	$\frac{2}{3}$	2	$4\frac{2}{3}$	$6\frac{2}{3}$	10

Our Ref:

Your Ref:

⑦ Find an equation of a line that passes through the point and has the indicated slope.

$$M = -\frac{3}{2} \quad (-1, 5)$$

$$-\frac{3}{2} = \frac{y-5}{x+1}$$

$$-\frac{3}{2}(x+1) = y-5$$

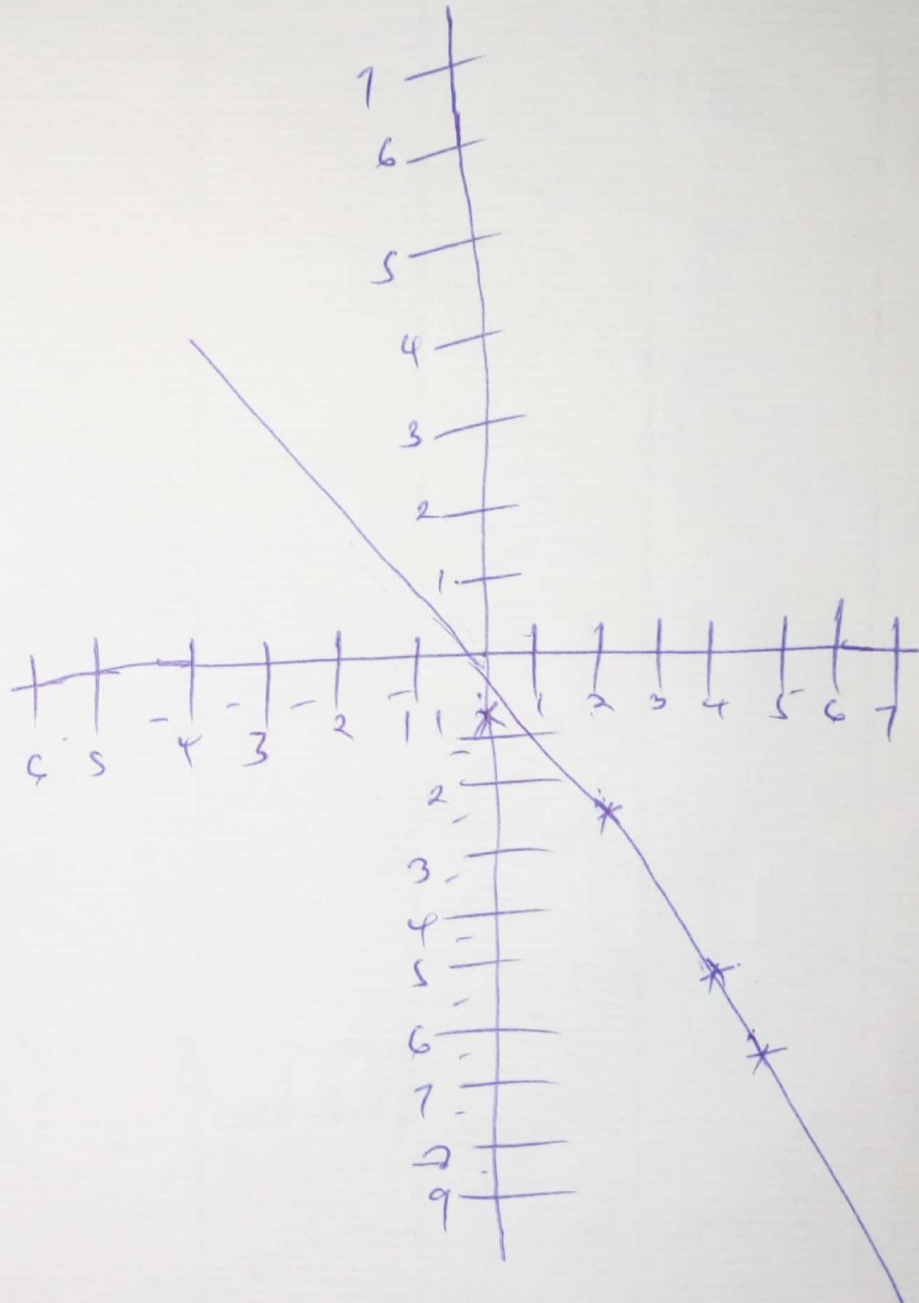
$$-\frac{3}{2}x - \frac{3}{2} = y-5$$

$$-\frac{3}{2}x - \frac{3}{2} + 5 = y$$

$$-\frac{3}{2}x + \frac{7}{2} = y$$

$$y = -\frac{3}{2}x + \frac{7}{2}$$

$$-\frac{3}{2} + \frac{7}{2} = \frac{4}{2} = 2$$



x	0	2	3	4	5
y	$-\frac{4}{5}$	$-\frac{11}{5}$	$-\frac{53}{10}$	$-\frac{34}{5}$	$-\frac{83}{10}$



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8) Find an equation of the line that passes through the points $(-2, 8)$ $(1, 5)$

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

$$m = \frac{5 - 8}{1 - (-2)}$$

$$m = \frac{-3}{-3}$$

$$m = 1$$

$$-1 = \frac{y - 8}{x + 2}$$

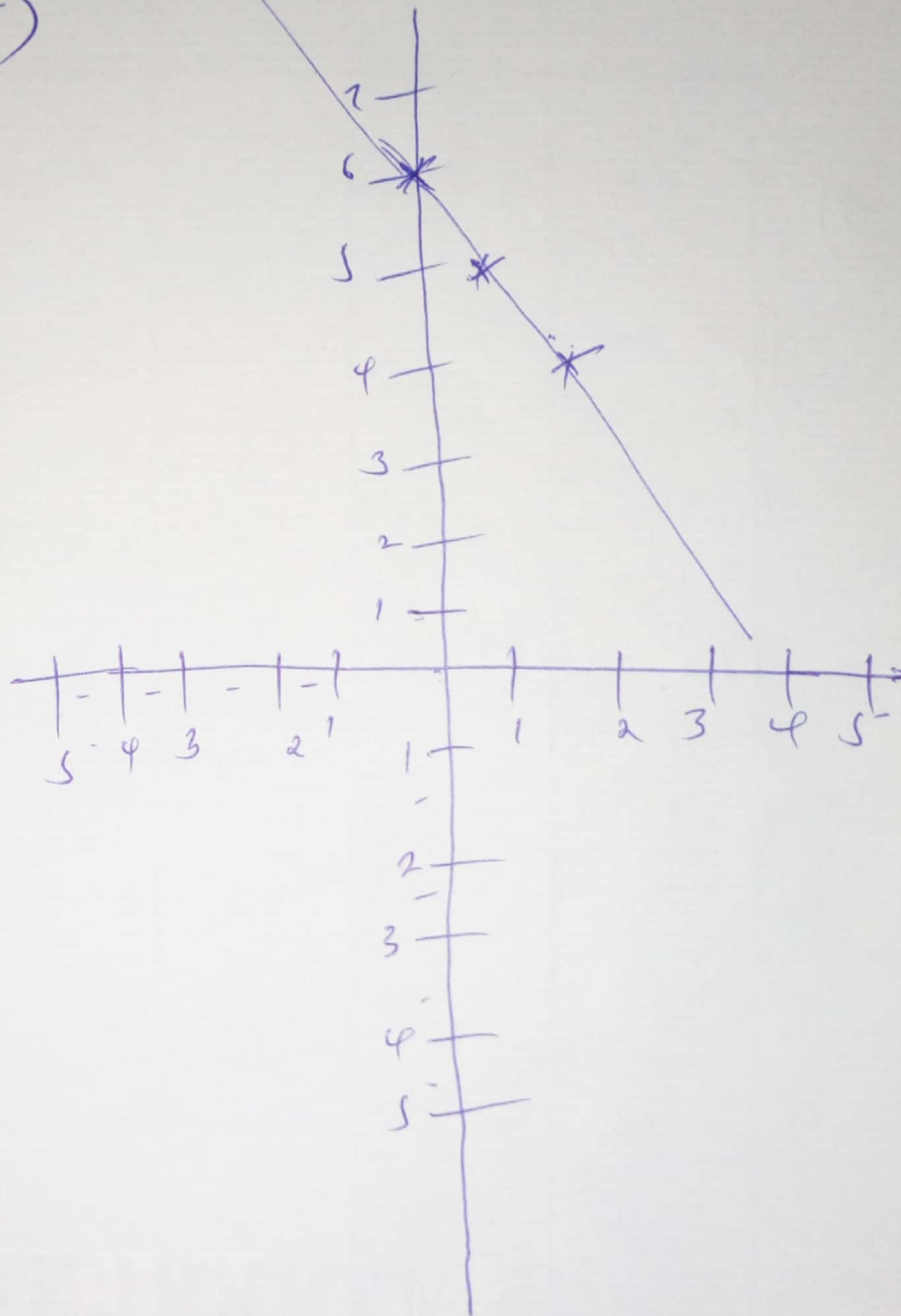
$$-1(x + 2) = y - 8$$

$$-x - 2 = y - 8$$

$$-x + 6 = y$$

$$-x + 6 = y$$

$$y = -x + 6$$



x	0	1	2	3
y	6	5	4	3

9) x = degrees celsius
 y = degrees fahrenheit.

$$100^{\circ}\text{C} \leftrightarrow 212^{\circ}\text{F}$$

$x_2 \quad y_2$

$$0^{\circ}\text{C} \leftrightarrow 32^{\circ}\text{F}$$

$x_1 \quad y_1$

$$(100, 212) (0, 32)$$

$$y = mx + b$$

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

$$= \frac{212 - 32}{100 - 0}$$

$$= \frac{180}{100}$$

$$= 1.8$$

$$y = 1.8x + 32$$

$$1.8x + 32 = 0$$

$$1.8x = -32$$

$$x = \frac{-32}{1.8}$$

$$x = -17.8$$

(3) use the equation to convert 55°F to degree celsius.

$$y = 1.8x + 32$$

$$55 = 1.8x + 32$$

$$55 - 32 = 1.8x$$

$$x = \frac{23}{1.8}$$

$$x = 12.778$$

(10) Evaluate the function

$$f(x) = 5x - 4$$

$$f'(x) = 5$$

(a) $f(0)$

$$= 5(0) - 4$$

$$= -4$$

(b) $f(2)$

$$= 5(2) - 4$$

$$= 10 - 4$$

(c) $f(6)$

$$= 5(6) - 4$$

$$= 30 - 4$$

(d) $f(x+4)$

$$= 5(x+4) - 4$$

$$= 5x + 20 - 4$$

$$= 5x + 16$$

(11) Evaluate.

$$f(x) = x^3$$

$$\frac{f(x+\Delta x) - f(x)}{\Delta x}$$

$$f(x) = x^3$$

$$\frac{f(x+\Delta x) - f(x)}{\Delta x}$$

$$\text{Let } \frac{f(x+\Delta) - x^3}{\Delta}$$

$$= \frac{x^3 + 3x^2\Delta + 3x\Delta^2 - x^3}{\Delta}$$

$$= \frac{3x^2\Delta + 3x\Delta^2}{\Delta}$$

Take the limit $\Delta \rightarrow 0$

$$\therefore 3x^2 + 3x\Delta$$

$$= 3x^2$$

$$\underline{\underline{3x^2}}$$

Our Ref:

Your Ref:

$$(12) f(x) = \sqrt{x}$$
$$g(x) = x^2 - 4$$

$$a) f(g(5))$$
$$= x^{-2}(x^2 - 25)$$
$$= x^{-2}(5^2 - 25)$$
$$= 0$$

$$b) g(f(5))$$
$$(x^2 - 25) x^{-2}$$
$$(x^2 - 25) \frac{1}{x^2}$$
$$(x^2 - 25) \frac{1}{25}$$

c)

$$g(f(0))$$
$$x^2 - 25(x^{-2})$$
$$x^2 - 25(0)$$
$$= 0$$

$$d) f(g(-6))$$
$$x^{-2}(x^2 - 25)$$
$$x^{-2}(-6^2 - 25)$$
$$x^{-2}(36 - 25)$$
$$= \frac{1}{9}x^2$$

$$e \quad f(g(x))$$

$$x^{-2}(x^2 - 25)$$

$$x^0 - 25$$

$$1 - 25$$

$$= \underline{\underline{-24}}$$

13) Convert the degree measure to radians as a multiple of π and as a decimal rounded to three decimal places.

(a) 45° (b) 150° (c) 225° d) 120°

$$\text{radians} = \text{degrees} \times \frac{\pi}{180}$$

$$(a) = 45^\circ \times \frac{\pi}{180} = 0.785$$

$$(b) 150 \times \frac{\pi}{180} = 2.618$$

$$(c) 225 \times \frac{\pi}{180} = 3.928$$

$$(d) 120 \times \frac{\pi}{180} = 2.095$$



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14) evaluate the six trigonometric function of angle θ .

$$\sin \theta = \frac{3}{5}$$

$$\cos \theta = \frac{4}{5}$$

$$\tan \theta = \frac{3}{4}$$

$$\cot \theta = \frac{4}{3}$$

$$\sec \theta = \frac{5}{4}$$

$$\csc \theta = \frac{5}{3}$$

$$(6) \sin \theta = \frac{12}{13}$$

$$\cos \theta = \frac{5}{13}$$

$$\tan \theta = \frac{12}{5}$$

$$\cot \theta = \frac{5}{12}$$

$$\sec \theta = \frac{13}{5}$$

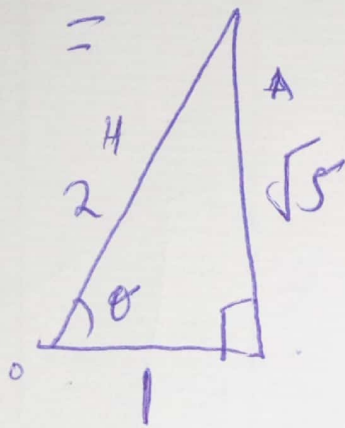
$$\csc \theta = \frac{13}{12}$$

Your Ref:

Is sketch a right triangle corresponding to the trigonometric function of the acute angle θ !

$$\sin \theta = \frac{1}{2}$$

$$\sin = \frac{O}{H}$$



$$\cos \theta = \frac{\sqrt{5}}{2}$$

$$\tan \theta = \frac{1}{\sqrt{5}}$$

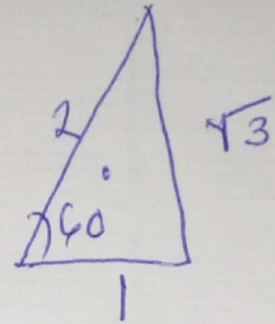
$$\cot \theta = \frac{\sqrt{5}}{1}$$

$$\sec \theta = \frac{2}{\sqrt{5}}$$

$$\csc \theta = \frac{2}{1}$$

16 Evaluate the sine, cosine and tangent of each angle.

a) $\sin 60^\circ = \frac{\sqrt{3}}{2}$



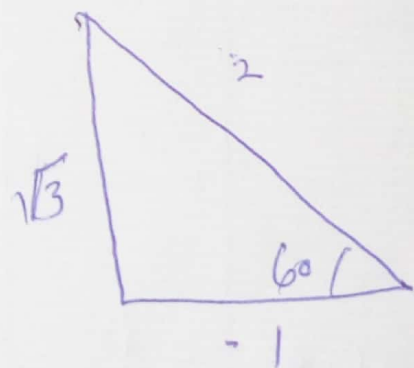
b) $\cos(60^\circ) = \frac{1}{2}$

c) $\tan 60^\circ = \frac{\sqrt{3}}{1}$

b) a) $\sin(120^\circ) = \frac{\sqrt{3}}{2}$

$\cos(120^\circ) = -\frac{1}{2}$

$\tan(120^\circ) = \frac{\sqrt{3}}{-1}$



Your Ref:

17 find two solutions of each eqn.
 $0 \leq \theta \leq \pi$

$$\begin{aligned} \text{a) } \cos \theta &= \frac{\sqrt{3}}{2} \\ &= \underline{\underline{30^\circ}} \end{aligned}$$

$$\begin{aligned} \text{b) } \cos \theta &= -\frac{\sqrt{3}}{2} \\ &= \underline{\underline{150^\circ}} \end{aligned}$$

(18) solve $2\sin^2 \theta = 1$

(16) solve $0 \leq \theta \leq 2\pi$

$$2\sin^2(\theta) = 1$$

$$2\sin^2(\theta) = 1$$

$$\underline{\underline{2\sin^2 \theta = 1}}$$

$$\sqrt{2\sin^2 \theta} = \sqrt{1/2}$$

$$\sin \theta = \pm \frac{1}{\sqrt{2}}$$

$$\underline{\underline{\sin \theta = \pm \frac{1}{\sqrt{2}}}}$$



19) solve the eqn

$$2 \cos^4(\theta) - \cos(\theta) = 1$$

$$y = ax^2 + bx + c$$

$$2(\cos^2 \theta - 2 \cos \theta) + (\cos \theta - 1) = 0$$

$$2 \cos \theta (\cos \theta - 1) + 1(\cos \theta - 1) = 0$$

$$(2 \cos \theta + 1)(\cos \theta - 1) = 0$$

$$\cos \theta = -\frac{1}{2} \text{ and } \cos \theta = 1$$

special angles = 120° , 240° and 0° ,