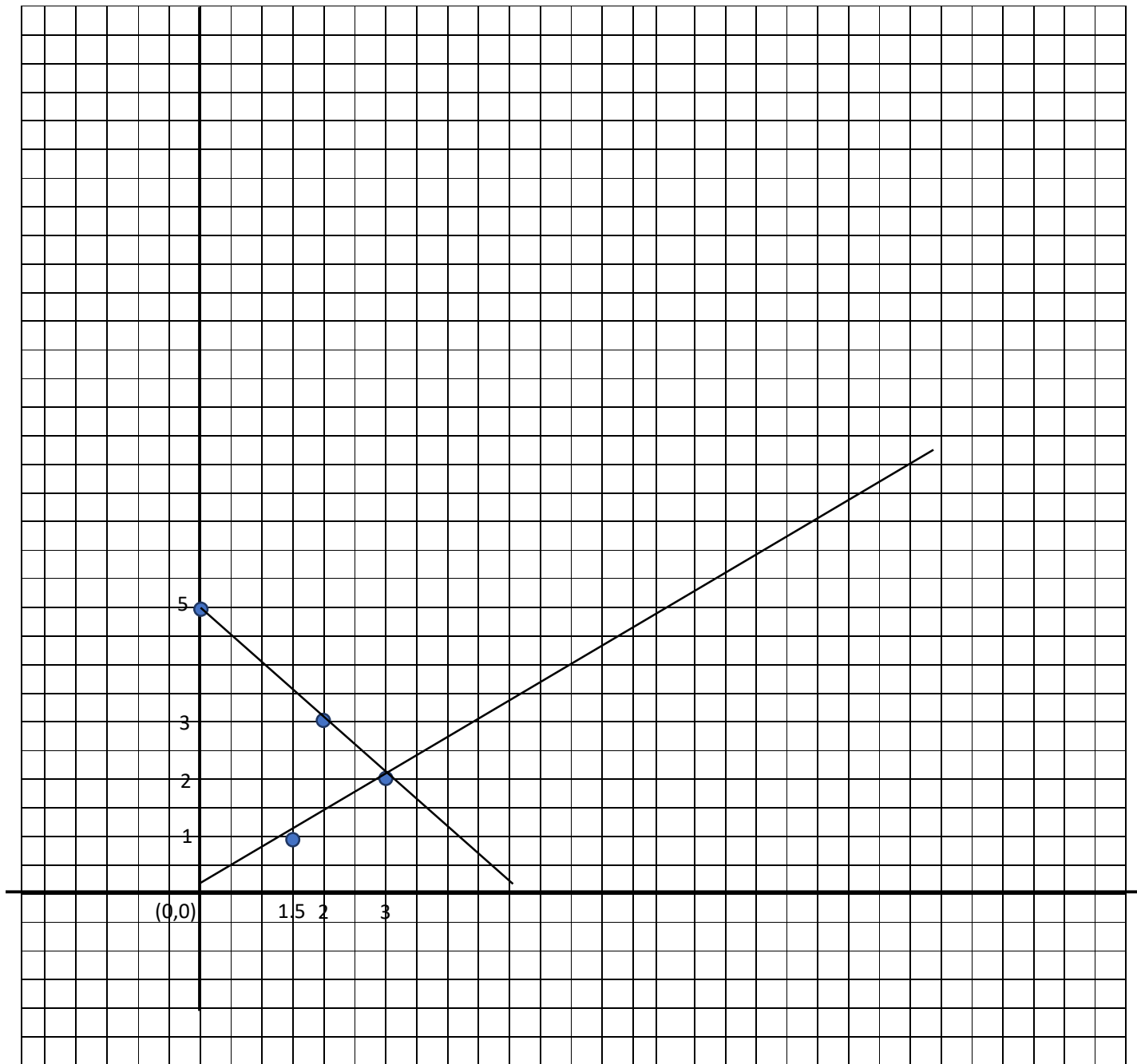


Question 1.



According to graph, collision point is (3,2)

Question 2.

1)

$$2x + 4 = 6 \rightarrow (1)$$

$$2x + 4y = 8 \rightarrow (2)$$

Add these two equations

$$(1) + (2)$$

$$4 + 4y = 14$$

$$4y = 10$$

$$y = \frac{10}{4}$$

$$\underline{y = 2.5}$$

$$(1)$$

$$2x = 6 - 4$$

$$\underline{x = 1}$$

2)

$$3x + 14y = 4 - 2y - x$$

$$4x + 16y = 4 \rightarrow (1)$$

$$3x + 6y + 2 = 11$$

$$3x + 6y = 9 \rightarrow (2)$$

Equation (1) multiplied by 3 – Equation (2) multiplied by 4

$$(1) \times 3 \quad (2) \times 4$$

$$12x + 48y - 12x - 24y = 12 - 36$$

$$24y = -24$$

$$y = -1$$

From (1)

$$4x = 4 - 16y$$

$$4x = 20$$

$$\underline{x = 5}$$

3)

$$11x + 3y = 15 \rightarrow (1)$$

$$9y + 6x = 4 \quad 3x + 4y$$

$$5y + 9x = 4 \rightarrow (2)$$

$$(1) \times 8 \quad (2) \times 3$$

$$55x + 15y - 15y - 27x = 75 - 12$$

$$28x = 63$$

$$x = \frac{63}{28}$$

$$\underline{\underline{x = 2.25}}$$

$$(1) * 9 - (2) * 11$$

$$99x + 27y - 55y - 99x = 135 - 44$$

$$28y = 91$$

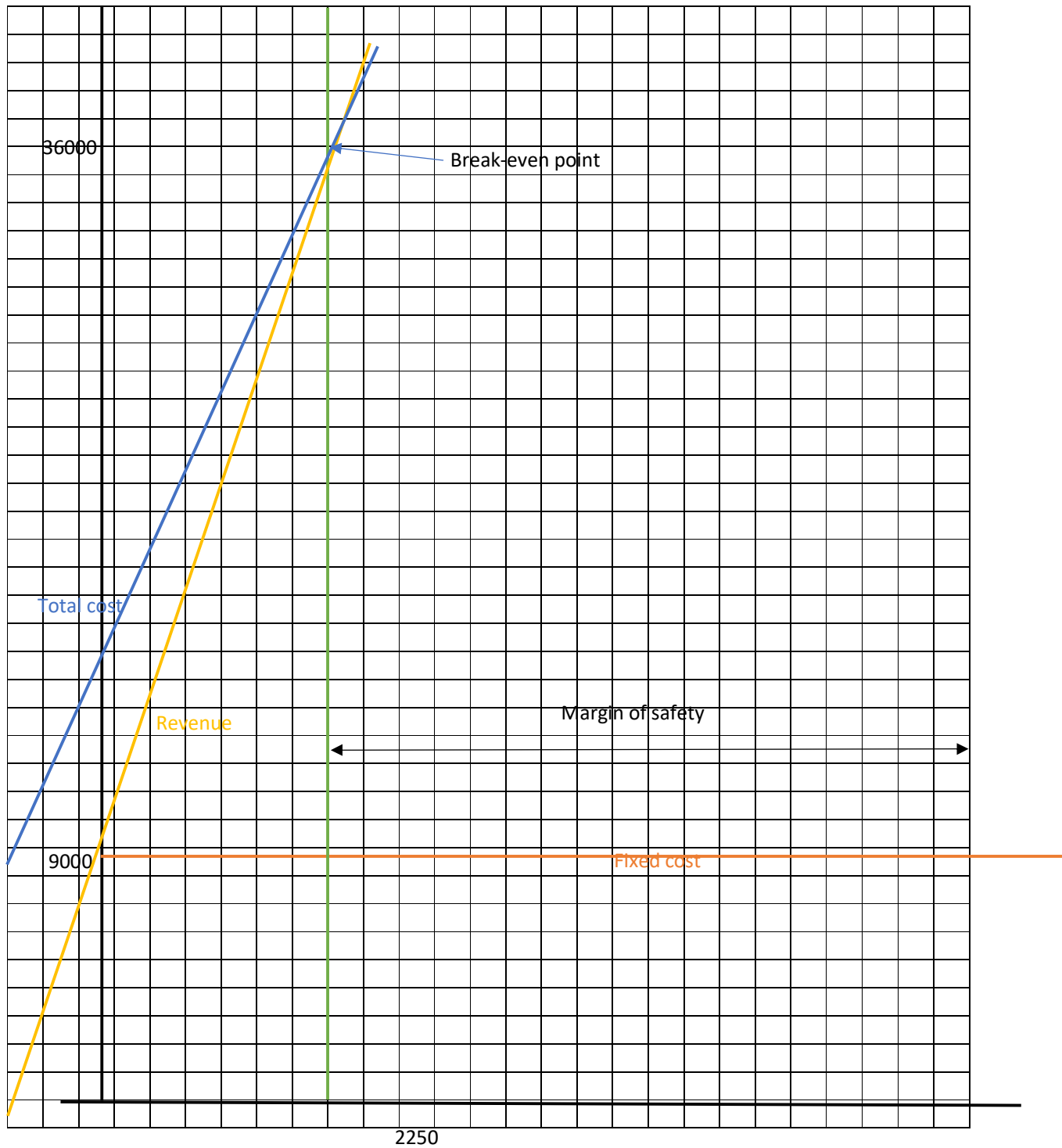
$$y = \frac{91}{28}$$

$$\underline{\underline{y = 3.25}}$$

Question 3.

- 1
 - a. Contribution per toy sold = $16 - (5 + 4 + 3) = 4\$$
 - b. Break-even in units of output = $\text{Fixed costs} / (\text{Sales price per unit} - \text{Variable cost per unit})$
 $= \frac{9000}{16 - 12}$
 $= 2250$
 - c. Break-even level of sales revenue = $2250 * 16$
 $= 36000\$$

2



1. Write down the gradient and y-intercept from each of the following equations.

a. $y=5x+1$

b. $y=3-x$

c. $y=10+9x$

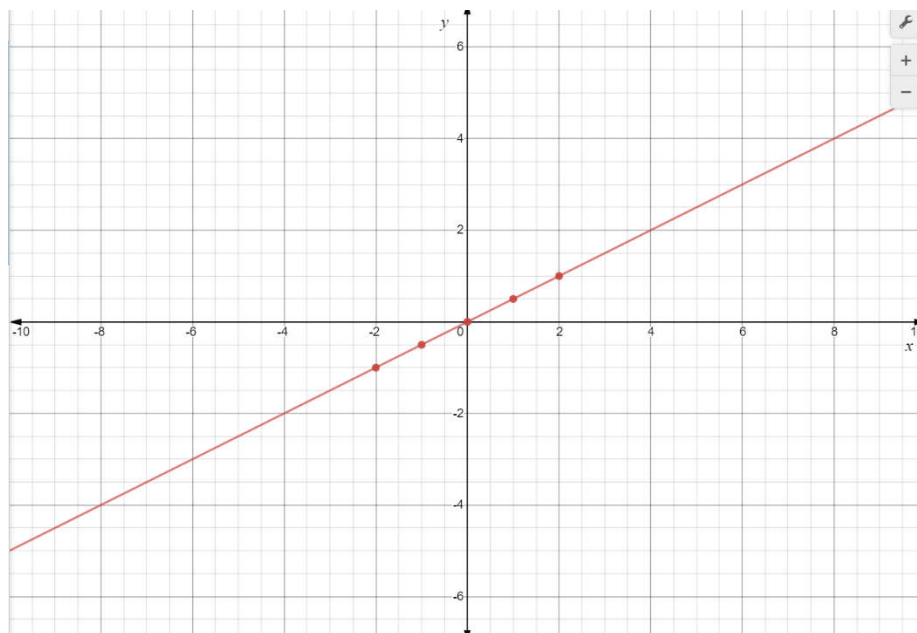
Equation	Gradient	Y intercept
$Y=5x+1$	5	1
$Y=3-x$	-1	3
$y=10+9x$	9	10

Q5

2. Draw the graph of these linear functions using a table of values.

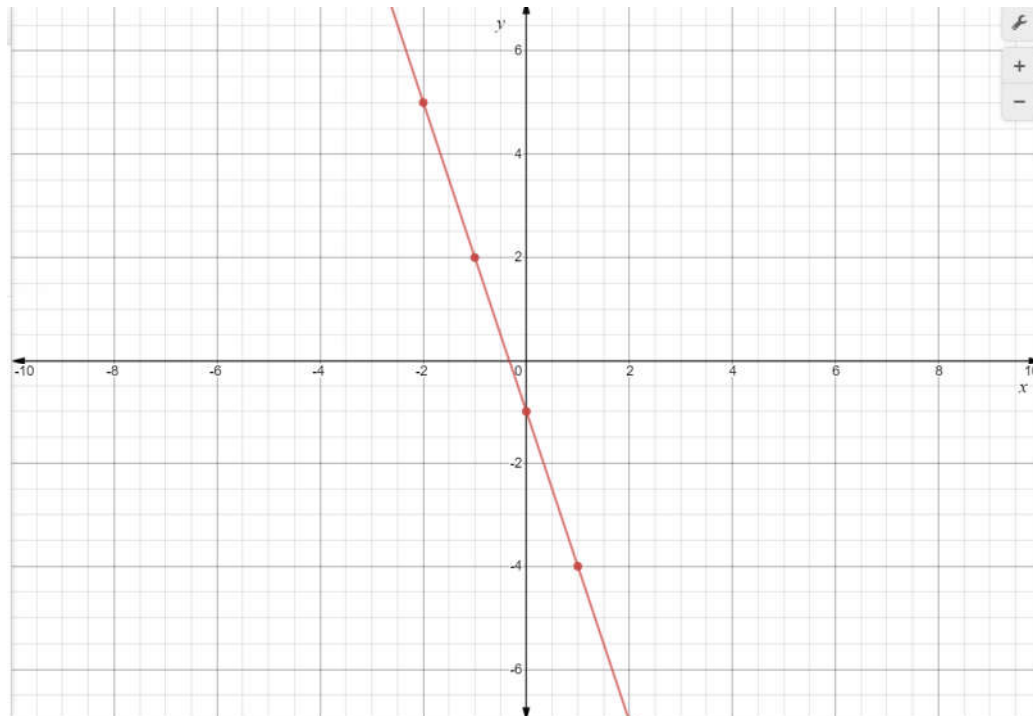
a) $y=0.5x$

x	$0.5x$
-2	-1
-1	-0.5
0	0
1	0.5
2	1



b) $y = 3x - 1$

x	$-3x - 1$
-2	5
-1	2
0	-1
1	-4
2	-7

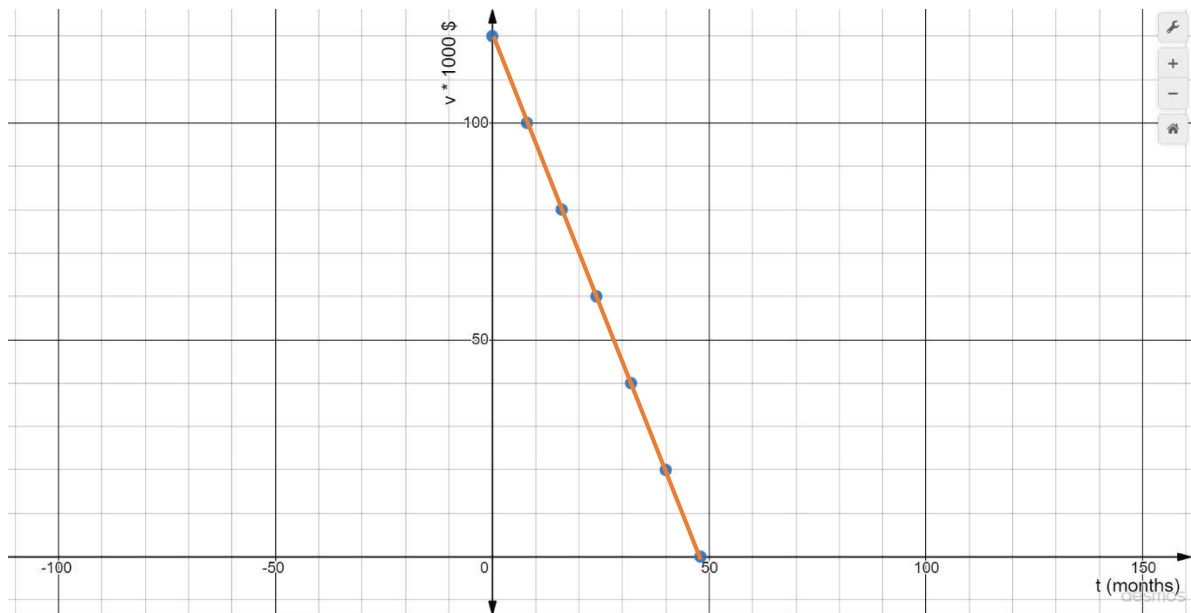


Q6

3. A new piece of equipment is purchased by a business for \$120 000. The value of the equipment (v in \$1000) is depreciated each month (t) using the table below.

t	0	8	16	24	32	40	48
v	120	100	80	60	40	20	0

- a. Plot the points from the table of values. Join the points to make a straight line.



- b. A linear model in the form $y=mx+b$ describes this situation. What is the linear model using t and v ?

$$m = \frac{(120-0)}{(0-48)} = 2.5$$

$$b = 120$$

Therefore,

$$y = 2.5x + 120; \text{ (y is measuring 1000 \$)}$$

- c. When does the model predict the equipment will have no value?

No value means $y = 0$

$$0 = 2.5x - 120$$

$$X = 48$$

After 48 months equipment hasn't value.

- d. Use the model to predict the value of the equipment after 2 months.

Putting, $x = 2$

$$y = 2.5 \cdot 2 + 120 = 115$$

Value of equipment = 115 000 \$

- e. When will the value of the equipment be \$105 000?

Putting $y = 105$

$$105 = -2.5 X + 120$$

$$-15 = -2.5X$$

$$X = 6$$

When t is 6 months.

- f. Use the model to predict the value of the equipment after 56 months. Can this happen? Explain your answer

Putting $x = 56$

$$Y = -2.5 * 56 + 120$$

$$Y = -20$$

That means, Value of the equipment is -20 000\$. That cannot happen, because the money cannot be negative. After the value became zero at 48 months, equipment is considered as zero value equipment furthermore.

Q7

4. Michael has a container filled with 10 litres of water. However, the container has a small hole in the base and is leaking at a rate of 0.25 litres per minute.

- a. Write a linear equation in the form $V = mt + b$ to describe this situation.

Let; time (t) measure in minutes

Volume that remains in the container (V) measure in litres

$$m = -0.25$$

Then we can write it as; $V = -0.25t + b$

at $t=0$, $V=10$

Therefore $b=10$

$$V = -0.25t + 10$$

b. What volume of water remains after 90 seconds?

$$t = 90/60 = 1.5$$

$$V = -0.25 \cdot 1.5 + 10$$

$$V_{\text{at } t=1.5} = 9.625 \text{ liters}$$

c. How long would it take for all the water to leak out?

Put the value for $V=0$

$$0 = -0.25t + 10$$

$$10 = 0.25t$$

$$t = 10/0.25$$

$$t = 40 \text{ minutes}$$

Q8

5. Draw the graph of these linear functions using a table of values.

$$y = 0.5x$$

$$y = 3x - 1$$

Same as Q5