868

868TUTORS

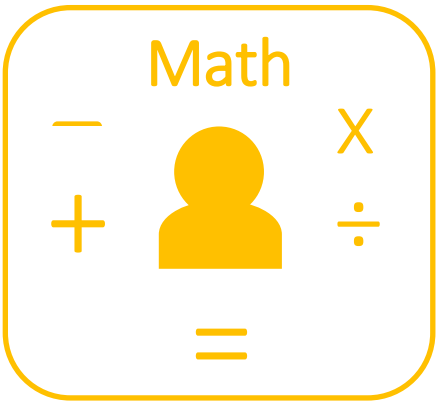
TUTORS

Preparation for

High School Mathematics

Straight Line Graphs

Solutions



Instructions and Tips:

- ✓ **You have 90 minutes to complete this worksheet**
- ✓ **This worksheet consists of 8 questions**
- ✓ **Write answers in the spaces provided**
- ✓ **All working must be clearly shown**
- ✓ **Label Graphs properly**

Student Name: _____

Student ID: _____

Date: _ _ / _ _ / _ _ _ _

Total Score:

Highest Score:

Tutor's Comments:

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Question 1

Consider the straight line equation: y = x + 1.

x	**-3**	**-2**	**-1**	**0**	**1**	**2**
y	-2	**-1**	0	1	**2**	3

(a) Complete the table above for: y = x + 1.

y = x + 1
when x = -3
y = -3 + 1
y = -2

y = x + 1
when x = -1
y = -1 + 1
y = 0

y = x + 1
when x = 0
y = 0 + 1
y = 1

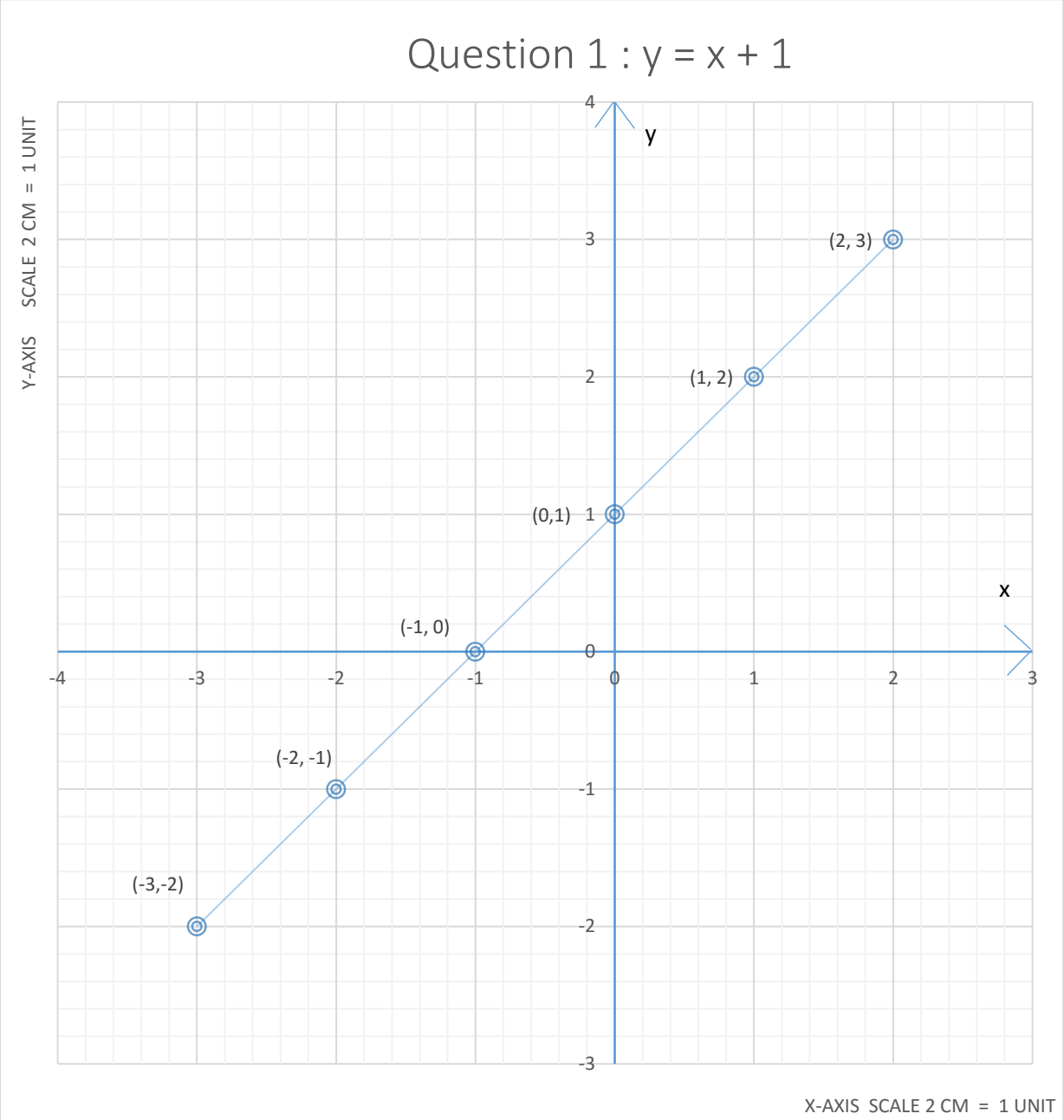
y = x + 1
when x = 2
y = 2 + 1
y = 3

(4 marks)

(b) On the graph paper on the next page, draw the graph of

y = x + 1 using the table above. Use a scale of 2 cm = 1 unit on the x-axis and 2 cm = 1 unit on the y-axis.

(6 marks)


Question 1 : y = x + 1
Y-AXIS SCALE 2 CM = 1 UNIT
y
x
(2, 3)
(1, 2)
(0,1)
(-1, 0)
(-2, -1)
(-3,-2)
4
3
2
1
0
-1
-2
-3
-4
-3
-2
-1
0
1
2
3
X-AXIS SCALE 2 CM = 1 UNIT

Question 2

Consider the straight line equation: y = x + 2.

x	**-3**	**-2**	**-1**	**0**	**1**	**2**
y	**-1**	0	1	2	3	**4**

(a) Complete the table above for: y = x + 2.

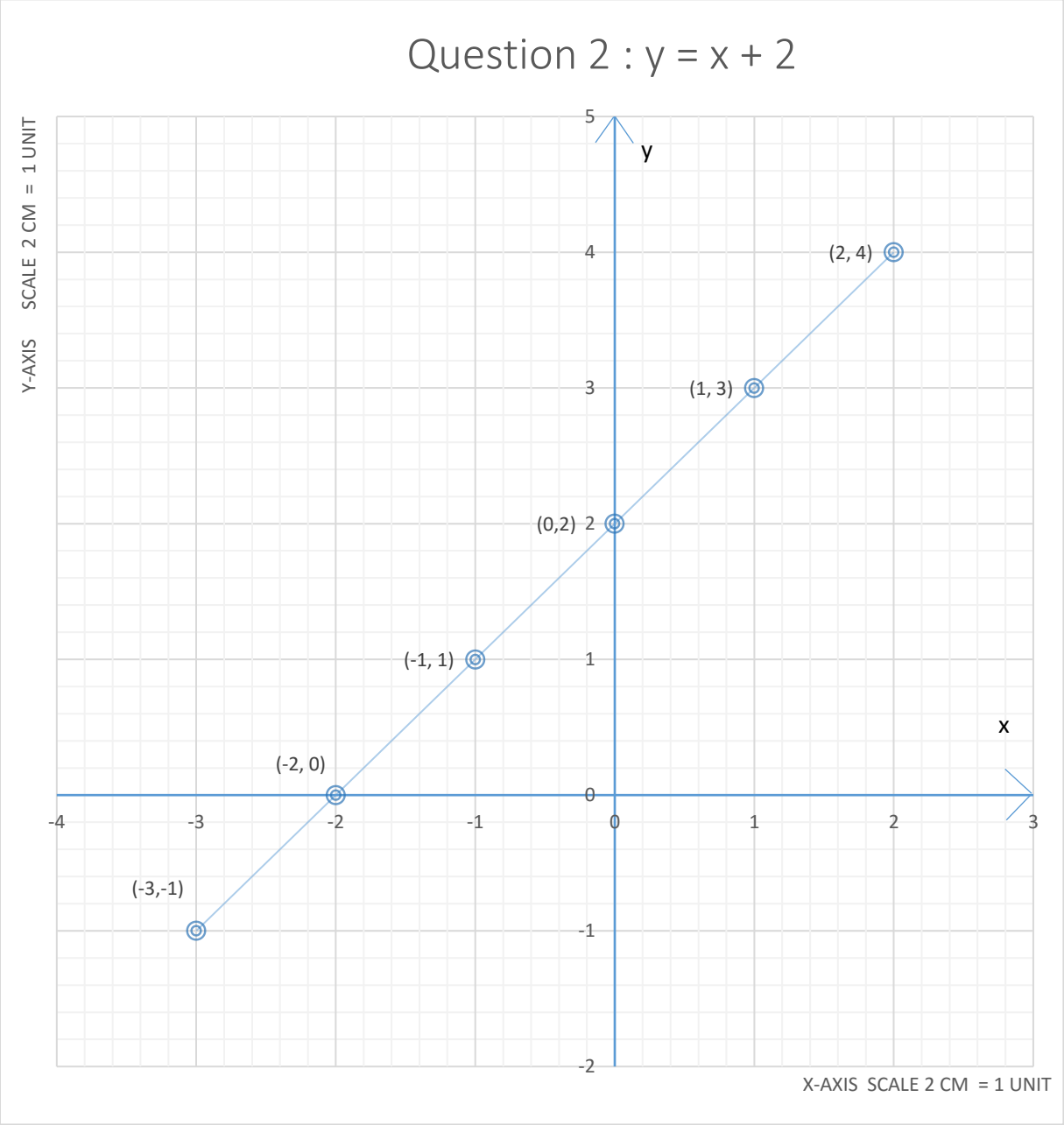
y = x + 2	y = x + 2	y = x + 2	y = x + 2
when x = -2	when x = -1	when x = 0	when x = 1
y = -2 + 2	y = -1 + 2	y = 0 + 2	y = 1 + 2
y = 0	**y = 1**	**y = 2**	**y = 3**

(4 marks)

(b) On the graph paper on the next page, draw the graph of

y = x + 2 using the table above. Use an appropriate scale.

(6 marks)


Question 2 : y = x + 2
Y-AXIS SCALE 2 CM = 1 UNIT
X-AXIS SCALE 2 CM = 1 UNIT
y
x
5
4
3
2
1
0
-1
-2
-4
-3
-2
-1
0
1
2
3
(2, 4)
(1, 3)
(0,2)
(-1, 1)
(-2, 0)
(-3,-1)

Question 3

Consider the straight line equation: y = x - 3.

x	**-3**	**-2**	**-1**	**0**	**1**	**2**	**3**
y	**-6**	-5	-4	-3	-2	**-1**	0

(a) Complete the table above for: y = x - 3.

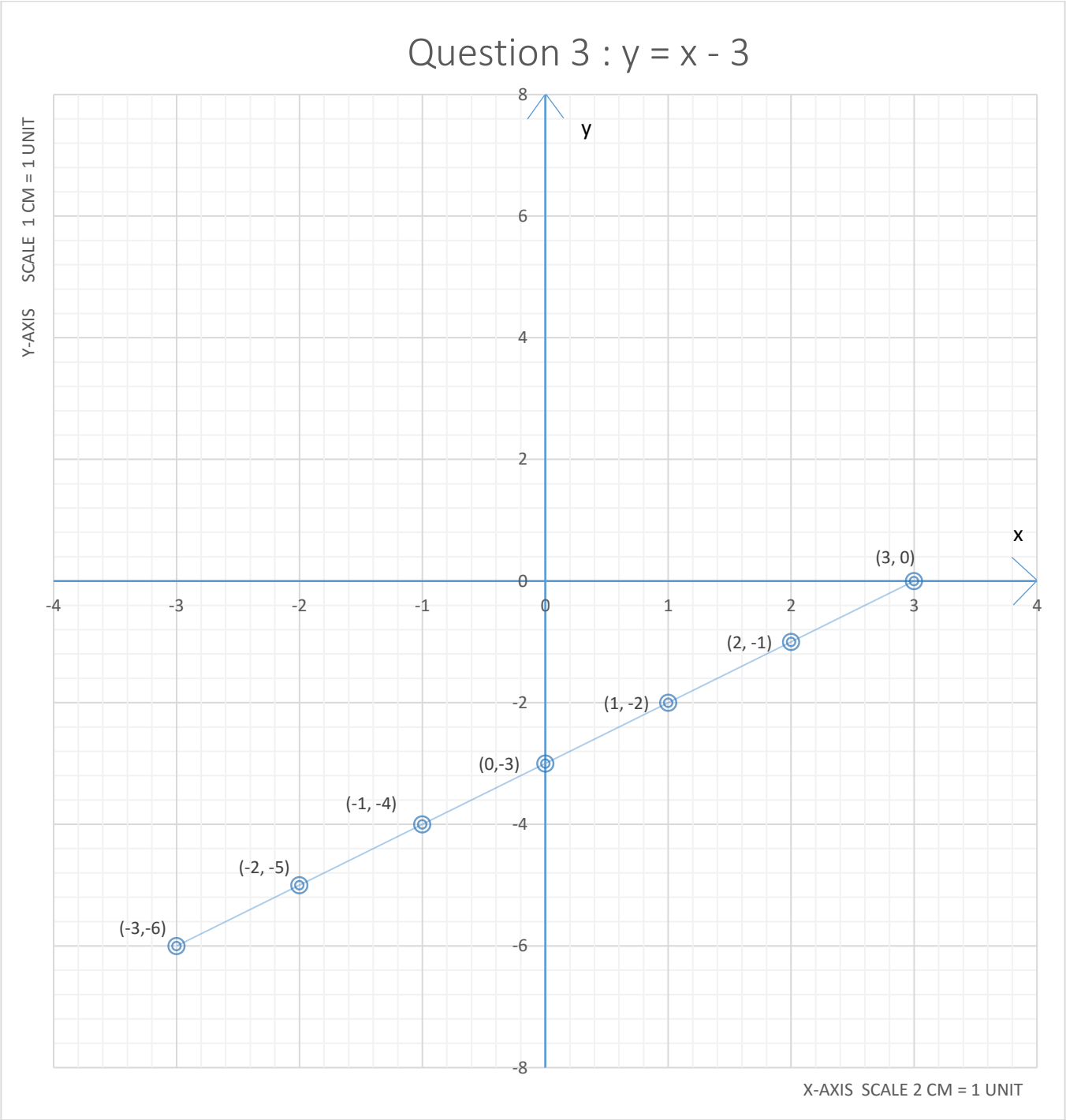
y = x - 3	y = x - 3	y = x - 3	y = x - 3	y = x - 3
when x = -2	when x = -1	when x = 0	when x = 1	when x = 3
y = -2 - 3	y = -1 - 3	y = 0 - 3	y = 1 - 3	y = 3 - 3
y = -5	**y = -4**	**y = -3**	**y = -2**	**y = 0**

(4 marks)

(b) On the graph paper on the next page, draw the graph of

y = x - 3 using the table above. Use an appropriate scale.

(6 marks)


Question 3 : y = x - 3
Y-AXIS SCALE 1 CM = 1 UNIT
X-AXIS SCALE 2 CM = 1 UNIT
y
x
8
6
4
2
0
-2
-4
-6
-8
-4
-3
-2
-1
0
1
2
3
4
(3, 0)
(2, -1)
(1, -2)
(0,-3)
(-1, -4)
(-2, -5)
(-3,-6)

Question 4

Consider the straight line equation: y = 2x + 4.

x	**-3**	**-2**	**-1**	**0**	**1**	**2**	**3**
y	**-2**	0	2	4	6	8	**10**

(a) Complete the table above for: y = 2x + 4.

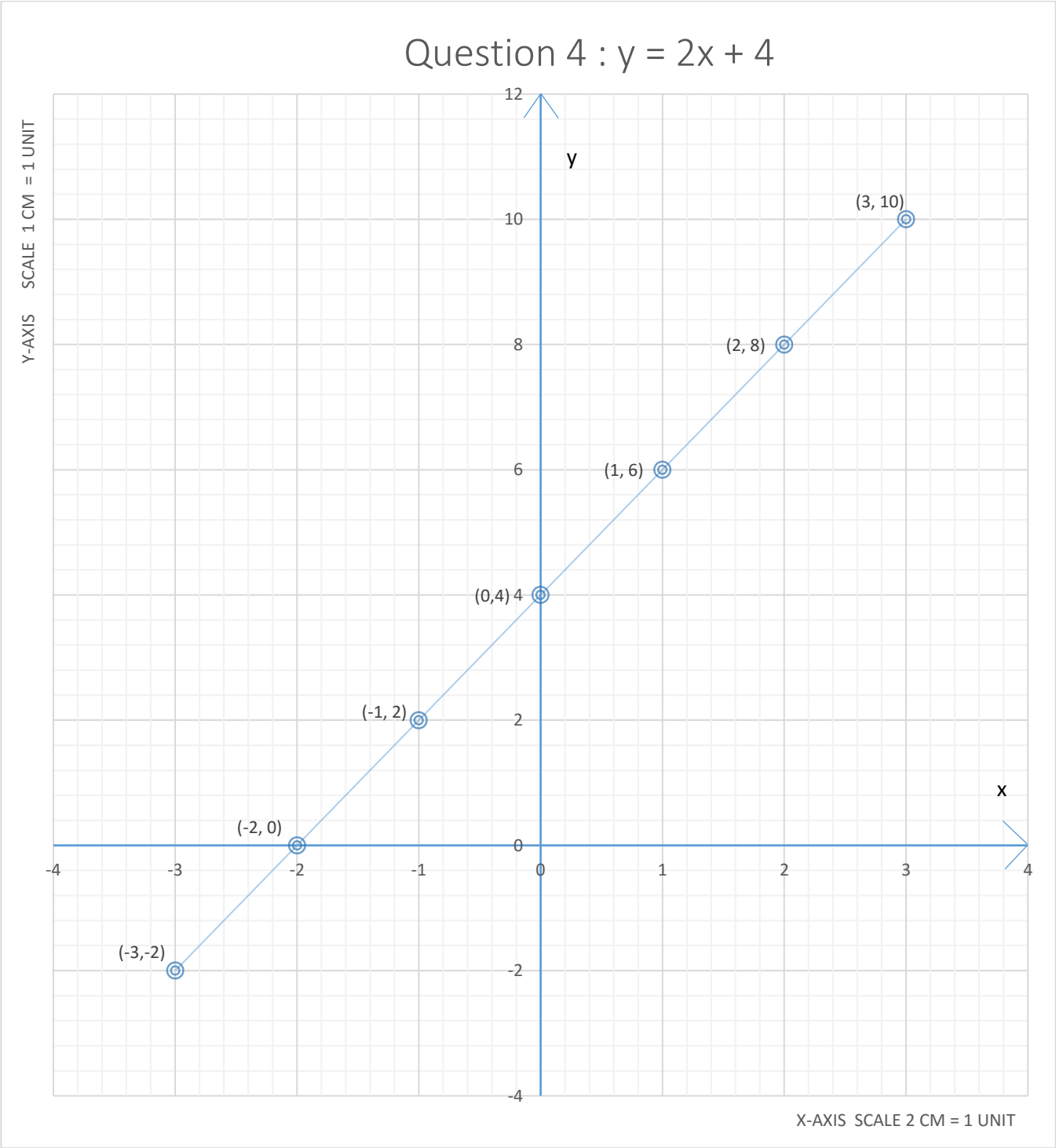
y = 2x + 4	y = 2x + 4	y = 2x + 4	y = 2x + 4	y = 2x + 4
when x = -2	when x = -1	when x = 0	when x = 1	when x = 2
y = 2(-2) + 4	y = 2(-1) + 4	y = 2(0) + 4	y = 2(1) + 4	y = 2(2) + 4
y = -4 + 4	y = -2 + 4	y = + 4	y = 2 + 4	y = 4 + 4
y = 0	**y = 2**	**y = 4**	**y = 6**	**y = 8**

(5 marks)

(b) On the graph paper on the next page, draw the graph of

y = 2x + 4 using the table above. Use an appropriate scale.

(6 marks)


Question 4 : y = 2x + 4
Y-AXIS SCALE 1 CM = 1 UNIT
X-AXIS SCALE 2 CM = 1 UNIT
y
x
12
10
8
6
4
2
0
-2
-4
-4
-3
-2
-1
0
1
2
3
4
(3, 10)
(2, 8)
(1, 6)
(0,4)
(-1, 2)
(-2, 0)
(-3,-2)

Question 5

Consider the straight line equation: y = 2x - 3.

x	**-3**	**-2**	**-1**	**0**	**1**	**2**	**3**
y	-9	-7	-5	-3	-1	1	3

(a) Complete the table above for: y = 2x - 3.

y = 2x - 3	y = 2x - 3	y = 2x - 3	y = 2x - 3	y = 2x - 3	y = 2x - 3	y = 2x - 3
when x = -3	when x = -2	when x = -1	when x = 0	when x = 1	when x = 2	when x = 3
y = 2(-3) - 3	y = 2(-2) - 3	y = 2(-1) - 3	y = 2(0) - 3	y = 2(1) - 3	y = 2(2) - 3	y = 2(3) - 3
y = -6 - 3	y = -4 - 3	y = -2 - 3	y = 0 - 3	y = 2 - 3	y = 4 - 3	y = 6 - 3
y = -9	**y = -7**	**y = -5**	**y = -3**	**y = -1**	**y = 1**	**y = 3**

(7 marks)

(b) On the graph paper on the next page, draw the graph of y = 2x - 3 using the table above. Use an appropriate scale.

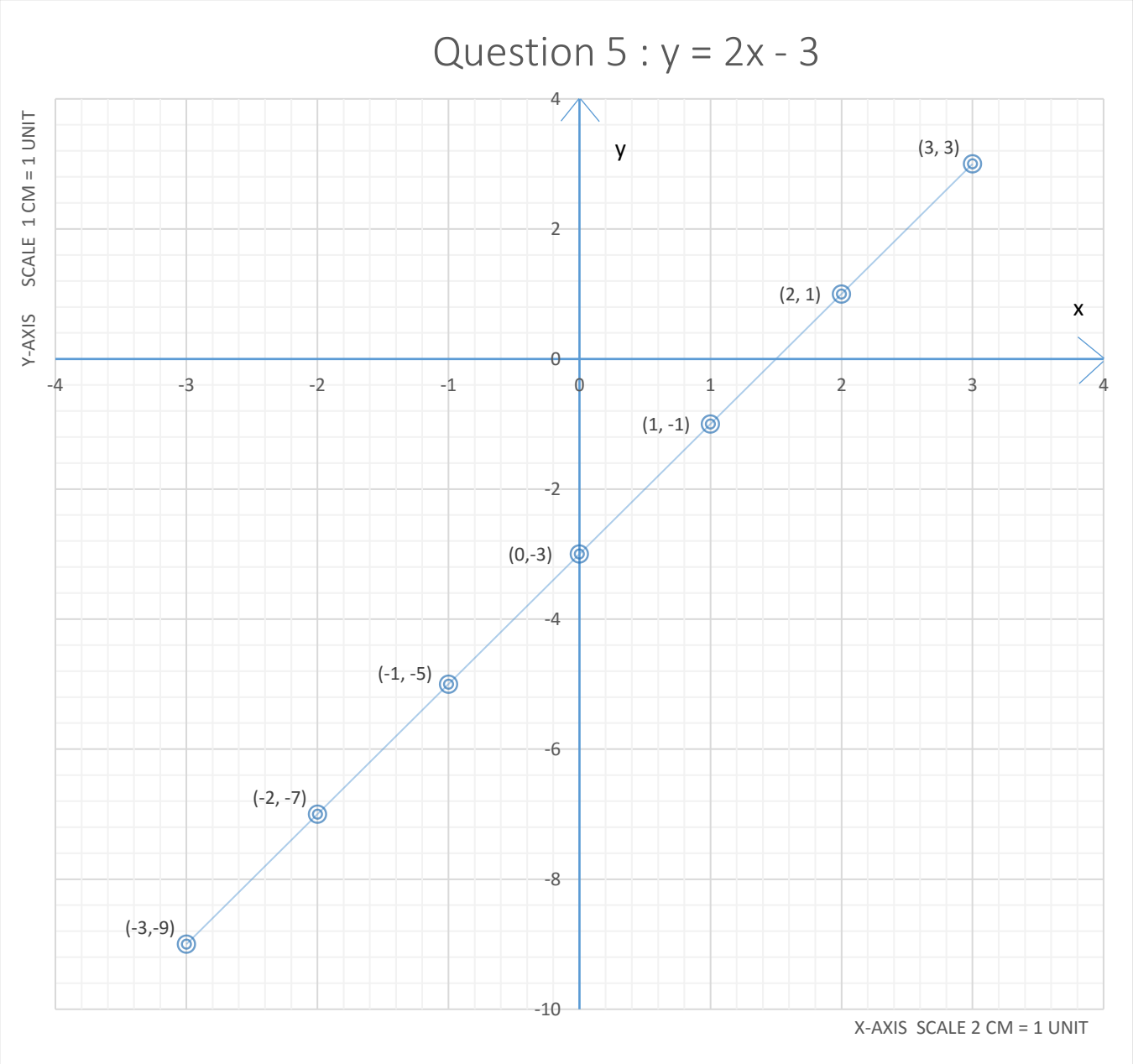
(6 marks)

Complete the following statements.

(c) The gradient of the straight line y = 2x - 3 is : 2

(d) The y intercept of the straight line y = 2x - 3 is -3

(2 marks)


Question 5 : y = 2x - 3
Y-AXIS SCALE 1 CM = 1 UNIT
y
x
(3, 3)
(2, 1)
(1, -1)
(0,-3)
(-1, -5)
(-2, -7)
(-3,-9)
4
2
0
-2
-4
-6
-8
-10
-4
-3
-2
-1
0
1
2
3
4
X-AXIS SCALE 2 CM = 1 UNIT

Question 6

Consider the straight line equation: $y = \frac{1}{2}x + 3$

x	-3	-2	-1	0	1	2	3	4	5	6
y	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6

(a) Complete the table above for: $y = \frac{1}{2}x + 3$.

$y = \frac{1}{2}x + 3$	$y = \frac{1}{2}x + 3$	$y = \frac{1}{2}x + 3$	$y = \frac{1}{2}x + 3$	$y = \frac{1}{2}x + 3$
when x = -3	when x = -2	when x = -1	when x = 0	when x = 1
$y = \frac{1}{2}(-3) + 3$	$y = \frac{1}{2}(-2) + 3$	$y = \frac{1}{2}(-1) + 3$	$y = \frac{1}{2}(0) + 3$	$y = \frac{1}{2}(1) + 3$
y = -1.5 + 3	y = -1 + 3	y = -0.5 + 3	y = 0 + 3	y = 0.5 + 3
y = 1.5	**y = 2**	**y = 2.5**	**y = 3**	**y = 3.5**

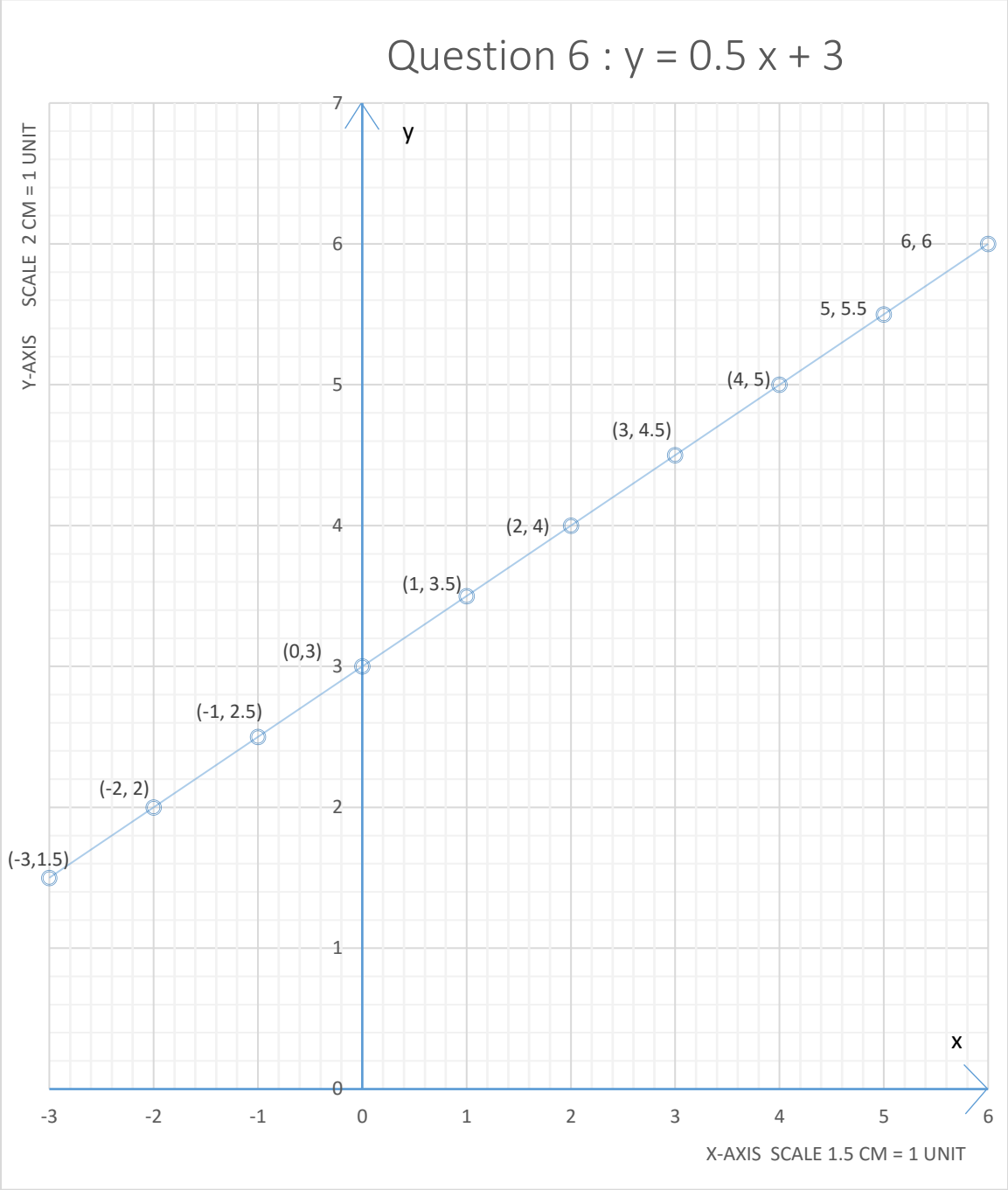
$y = \frac{1}{2}x + 3$	$y = \frac{1}{2}x + 3$	$y = \frac{1}{2}x + 3$	$y = \frac{1}{2}x + 3$	$y = \frac{1}{2}x + 3$
when x = 2	when x = 3	when x = 4	when x = 5	when x = 6
$y = \frac{1}{2}(2) + 3$	$y = \frac{1}{2}(3) + 3$	$y = \frac{1}{2}(4) + 3$	$y = \frac{1}{2}(5) + 3$	$y = \frac{1}{2}(6) + 3$
y = 1 + 3	y = 1.5 + 3	y = 2 + 3	y = 2.5 + 3	y = 3 + 3
y = 4	**y = 4.5**	**y = 5**	**y = 5.5**	**y = 6**

(10 marks)

(b) On the graph paper on the next page, draw the graph of

$y = \frac{1}{2}x + 3$ using the table above. Use an appropriate scale.

(6 marks)


Question 6 : y = 0.5 x + 3
Y-AXIS SCALE 2 CM = 1 UNIT
X-AXIS SCALE 1.5 CM = 1 UNIT
y
x
7
6
5
4
3
2
1
0
-3
-2
-1
0
1
2
3
4
5
6
(-3,1.5)
(-2, 2)
(-1, 2.5)
(0,3)
(1, 3.5)
(2, 4)
(3, 4.5)
(4, 5)
5, 5.5
6, 6

Question 7

Consider the straight line equation: $y = -\frac{1}{2}x + 3$

x	-3	-2	-1	0	1	2	3	4
y	4.5	4	3.5	3	2.5	2	1.5	1

(a) Complete the table above for: $y = -\frac{1}{2}x + 3$

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

when x = -3

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

$y = 1.5 + 3$

y = 4.5

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

when x = -2

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

$y = 1 + 3$

y = 4

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

when x = -1

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

$y = 0.5 + 3$

y = 3.5

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

when x = 0

$y = -\frac{1}{2}(0) + 3$

$y = 0 + 3$

y = 3

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

when x = 1

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

$y = -0.5 + 3$

y = 2.5

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

when x = 2

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

$y = -1 + 3$

y = 2

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

when x = 3

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

$y = -1.5 + 3$

y = 1.5

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

when x = 4

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

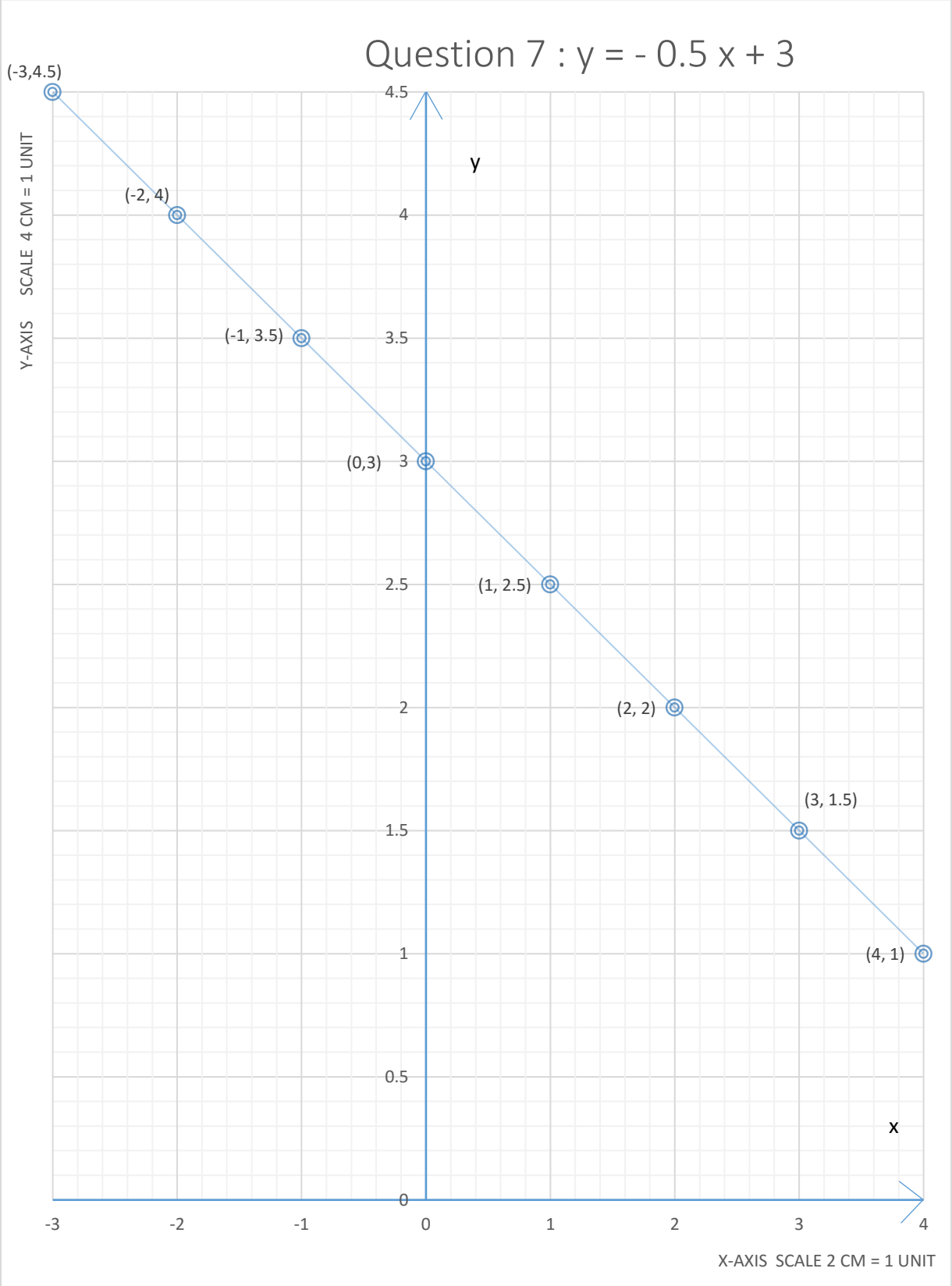
$y = -2 + 3$

y = 1

(8 marks)

(b) On the graph paper on the next page, draw the graph of $y = -\frac{1}{2}x + 3$ using the table above. Use an appropriate scale.

(6 marks)


Question 7 : y = - 0.5 x + 3
(-3,4.5)
(-2, 4)
(-1, 3.5)
(0,3)
(1, 2.5)
(2, 2)
(3, 1.5)
(4, 1)
y
x
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-3
-2
-1
0
1
2
3
4
Y-AXIS SCALE 4 CM = 1 UNIT
X-AXIS SCALE 2 CM = 1 UNIT

Question 8

Determine whether the following pairs of lines are perpendicular or parallel to one another. Give an explanation in each case.

(a) y = 2x + 3 and y = 2x - 3

The lines y = 2x + 3 and y = 2x − 3 are parallel because they have the same gradient, m = 2.

(b) y = 3x + 8 and $y = -\frac{1}{3}x + 4$

The lines y = 3x + 8 and $y = -\frac{1}{3}x + 4$ are perpendicular because the product of their gradient is = -1.

(c) 2y = 10x + 1 and 3y = 15x + 3

$2y = 10x + 1$

$y = \frac{10x + 1}{2}$

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

$3y = 15x + 3$

$y = \frac{15x + 3}{3}$

$y = 5x + 1$

The lines are parallel because the gradient is the same, m = 5.

(d) 6y = 1x + 4 and 2y = -12x + 8

$6y = 1x + 4$

$y = \frac{1x + 4}{6}$

$y = \frac{1}{6}x + \frac{4}{6}$

$y = \frac{1}{6}x + \frac{2}{3}$

$2y = -12x + 8$

$y = \frac{-12x + 8}{2}$

$y = -6x + 4$

The lines are perpendicular because the product of their gradient is = -1.

$\frac{1}{6} \times -6 = -1$

(8 marks)

END OF WORKSHEET