I.G.C.S.E. Drawing Graphs

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Question 1

Construct a table and draw the following straight-line graphs.

a. $y = 3x - 2$, from $x = -2$ to $x = 4$.

b. $y = 3 - 2x$, from $x = -2$ to $x = 5$.

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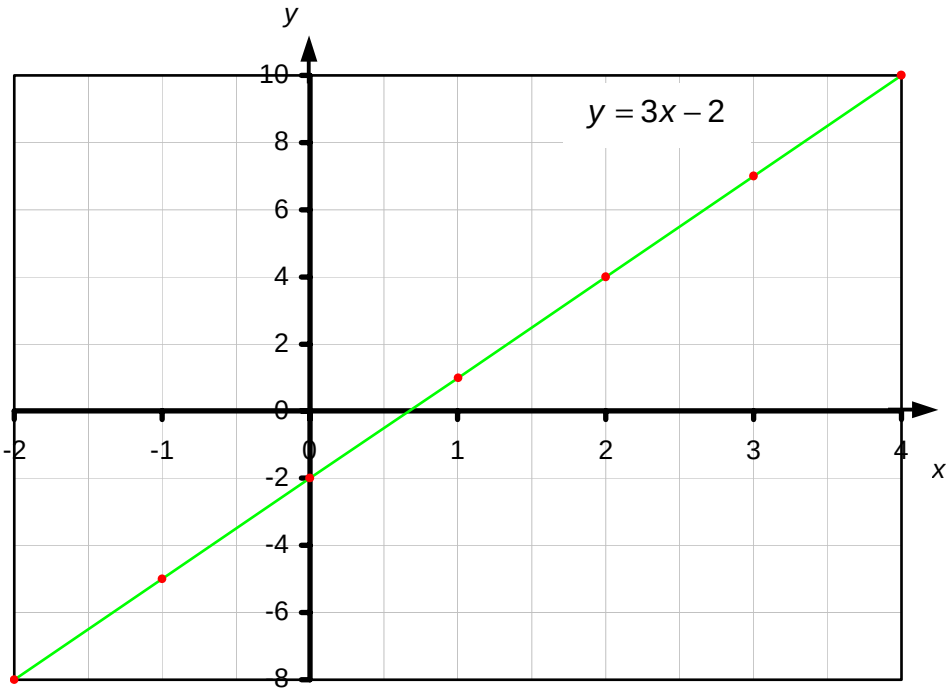
Solution to question 1

a. $y = 3x - 2$

First construct a table.

x	-2	-1	0	1	2	3	4
3x	-6	-3	0	3	6	9	12
-2	-2	-2	-2	-2	-2	-2	-2
y	-8	-5	-2	1	4	7	10

We therefore plot the following points (-2, -8), (-1, -5), (0, -2), (1, 1), (2, 4), (3, 7), (4, 10).



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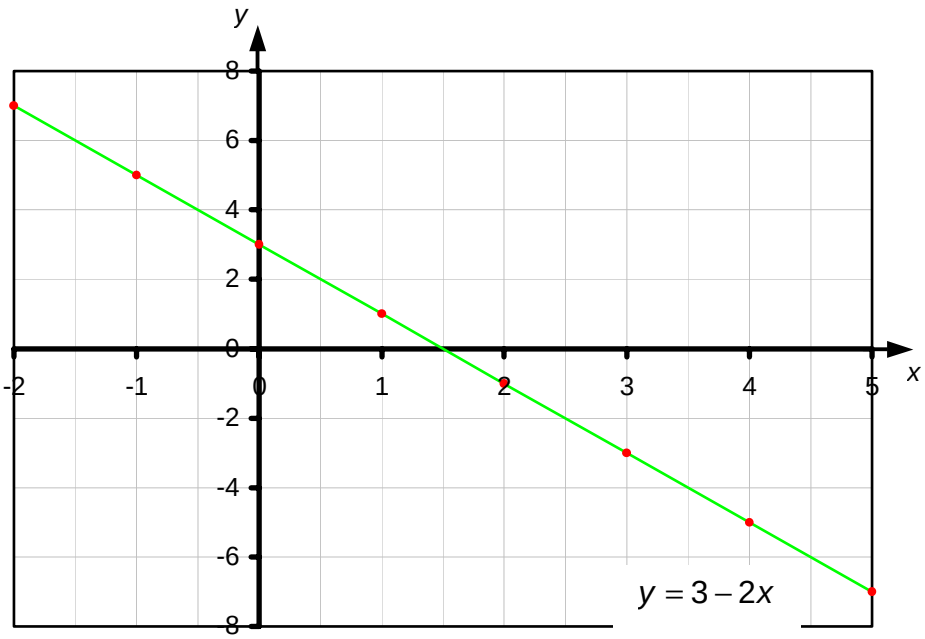
b. $y = 3 - 2x$

First construct a table.

x	-2	-1	0	1	2	3	4	5
3	3	3	3	3	3	3	3	3
$-2x$	4	2	0	-2	-4	-6	-8	-10
y	7	5	3	1	-1	-3	-5	-7

We therefore plot the following points (-2, 7), (-1, 5), (0, 3), (1, 1), (2, -1), (3, -3), (4, -5), (5, -7).



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Question 2

a. For the graph of $y = 2x^2 - 3x - 2$, copy and complete the following table.

x	-2	-1	0	1	2	3	4
$2x^2$							
$-3x$							
-2							
y							

b. Write down the coordinates of the points to be plotted.

c. Draw a graph on the graph paper. Using the scale 2 cm for 1 unit on the *x*-axis and 1 cm for 1 unit on the *y*-axis.

d. Use your graph to solve the following equations clearing showing on your graph how you have obtained your answer.

i. $2x^2 - 3x - 2 = 0$
ii. $2x^2 - 3x - 2 = 9$
iii. $2x^2 - 3x - 2 = -2$

e. Explain why the equation $2x^2 - 3x - 3 = -5$ does not have any solution.

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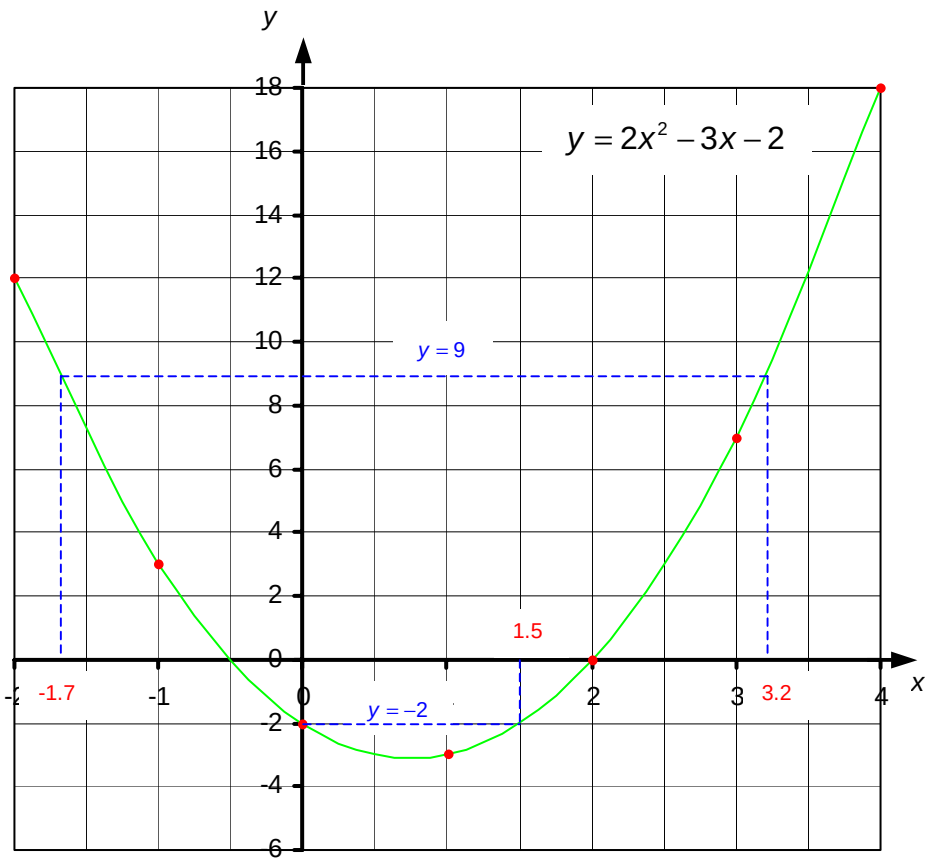
Solution to question 2

a. First copy and complete the table for $y = 2x^2 - 3x - 2$

x	-2	-1	0	1	2	3	4
$2x^2$	8	2	0	2	8	18	32
$-3x$	6	3	0	-3	-6	-9	-12
-2	-2	-2	-2	-2	-2	-2	-2
y	12	3	-2	3	0	7	18

b. We plot the points (-2, 12), (-1, 3), (0, -2), (1, 3), (2, 0), (3, 7), (4, 18).

c.



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d. **i.** $2x^2 - 3x - 2 = 0$

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

This implies we need to find where the curve is equal to 0. We look to at where $y = 0$. This is where the curve cuts the x-axis, which gives the solutions $x = -0.5$ or $x = 2$.

ii. $2x^2 - 3x - 2 = 9$

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

We draw on a dashed line at $y = 9$ (see blue line on curve) and read off the solutions $x = -1.7$ or $x = 3.2$

iii. $2x^2 - 3x - 2 = -2$

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

We draw on a dashed line at $y = -2$ (see blue line on curve) and read off the solutions $x = 0$ or $x = 1.5$.

e. $2x^2 - 3x - 2 = -5$

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

If we were to draw on the line $y = -5$, we would notice that it would not intercept the curve, therefore there are no solutions to the equation $2x^2 - 3x - 2 = -5$.

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