MODULE
MATHEMATICS SPM

1. a) Complete Table 1 for the equation $y = 9 - 4x - 3x^2$ by writing the value of y when $x = -1$ and $x = 2$. (2%)

x	-3	-2	-1	0	1	1.5	2	3
y	-6	5		9	2	-3.8		-30

Table 1

b) *For this part of the question, use graph paper. You may use a flexible curve ruler.*
By using a scale of 2 cm to 1 unit on the x-axis and 2 cm to 5 units on the y-axis, draw the graph of $y = 9 - 4x - 3x^2$ for $-3 \le x \le 3$. (4%)

c) From your graph, find
i) the value of y when $x = -1.7$
ii) the value of x when $y = -16$ (2%)

Answer:
a) y = …… , ……..
c) i) y = …….. ii) x = ……
d) x = …… , ……..

d) Draw a suitable straight line on your graph to find all the values of x which satisfy the equation $3x^2 + 2x - 13 = 0$ for $-3 \le x \le 3$. State the values of x. (4%)

2. a) Complete Table 2 for the equation $y = -\frac{6}{x}$ by writing the value of y when $x = -1.5$ and $x = 4.2$. (2%)

x	-3	-2	-1.5	-1	1	2	3	3.5	4.2	5
y	2	3		6	-6	-3	-2	-1.7		-1.2

Table 1

b) *For this part of the question, use graph paper. You may use a flexible curve ruler.*
By using a scale of 2 cm to 1 unit on the x-axis and 2 cm to 1 unit on the y-axis, draw the graph of $y = -\frac{6}{x}$ for $-3 \le x \le 5$. (4%)

c) From your graph, find
i) the value of y when $x = -2.4$
ii) the value of x when $y = 3.3$ (2%)

Answer:
b) y = …… , ……..
c) i) y = …….. ii) x = ……
d) x = …… , ……..

d) Draw a suitable straight line on your graph to find all the values of x which satisfy the equation $-x^2 + 6 = 0$ for $-3 \le x \le 5$. State the values of x. (4%)

3. a) Complete Table 1 for the equation $y = 3 + 10x - 2x^3$ by writing the value of y when $x = -2$ and $x = 1$. (2%)

x	-3	-2	-1	-0.5	0	0.5	1	2	3
y	27		-5	-1.8	3	7.8		7	-21

Table 1

b) *For this part of the question, use graph paper. You may use a flexible curve ruler.*
By using a scale of 2 cm to 1 unit on the x-axis and 2 cm to 5 units on the y-axis, draw the graph of $y = 3 + 10x - 2x^3$ for $-3 \le x \le 3$. (4%)

c) From your graph, find
i) the value of y when $x = -1.2$
ii) the value of x when $y = 14.5$ (2%)

Answer:
c) y = …… , ……..
c) i) y = …….. ii) x = ……
d) x = …… , ……..

d) Draw a suitable straight line on your graph to find all the values of x which satisfy the equation $2x^3 - 15x = 8$ for $-3 \le x \le 3$. State the values of x. (4%)

4. a) Complete Table 1 in the answer space for the equation $y = \frac{40}{x}$.

x	-4	-3	-2.4	-2	-1	1	1.5	2	3	4
y	-10		-16.7	-20	-40	40		20		10

Table 1

b) For this part of the question, use the graph paper. You may use a flexible curve rule.
By using a scale of 2 cm to 1 unit on the x-axis and 2 cm to 10 units on the y-axis, draw the graph of $y = \frac{40}{x}$ for $-4 \le x \le 4$.

Answer:

d) y = ……, ……

c) i) y = …….. ii) x = ……

d) x = ……, ……

c) From your graph, find

i. the value of y when $x = 2.9$

ii. the value of x when $y = -5$

d) Draw a suitable straight line on your graph to find a value of x which satisfies the equation $7x^2 + 3x = 40$ for $-4 \le x \le 4$.
State the value of x.

5. a) Complete Table 2 in the answer space for the equation $y = x^3 - 5x - 4$.

x	-4	-3.5	-3	-2	-1	0	1	2	3	3.5	4
y	-48	-29.4		-2		-4	-8		8	21.4	40

Table 2

b) For this part of the question, use the graph paper. You may use a flexible curve rule.
By using a scale of 2 cm to 1 unit on the x-axis and 2 cm to 10 units on the y-axis, draw the graph of $y = x^3 - 5x - 4$ for $-4 \le x \le 4$.

Answer:

e) y = ……, ……

c) i) y = …….. ii) x = ……

d) x = ……, ……

c) From your graph, find

i. the value of y when $x = 1.6$

ii. the value of x when $y = 25$

d) Draw a suitable straight line on your graph to find all the values of x which satisfies the equation $x^3 = 12x - 6$ for $-4 \le x \le 4$. State these values of x.

6. a) Complete Table 1 in the answer space for the equation $y = \frac{12}{x}$.

x	-4	-3	-2	-1.5	-1	1	1.5	2	3	4
y	-3	-4	-6		-12	12	8	6	4	

Table 3

b) For this part of the question, use the graph paper. You may use a flexible curve rule.
By using a scale of 2 cm to 1 unit on the x-axis and 2 cm to 2 units on the y-axis, draw the graph of $y = \frac{12}{x}$ for $-4 \le x \le 4$.

Answer:

f) y = ……, ……

c) i) y = …….. ii) x = ……

d) x = ……, ……

c) From your graph, find

i. the value of y when $x = -2.5$

ii. the value of x when $y = 5$

d) Draw a suitable straight line on your graph to find a value of x which satisfies the equation $\frac{6}{x} = 2x + 3$ for $-4 \le x \le 4$.

State these values of x.

7. a) Complete Table 2 in the answer space for the equation $y = 3x^2 - 14x + 5$.

x	-1	-0.5	0	1	2	3	4	5	5.5	6
y		12.75	5	-6	-11		-3	10	18.75	29

Table 4

b) For this part of the question, use the graph paper. You may use a flexible curve rule.
By using a scale of 2 cm to 1 unit on the x-axis and 2 cm to 5 units on the y-axis, draw the graph of $y = 3x^2 - 14x + 5$ for $-1 \le x \le 6$.

Answer:

g) y = ……, ……

c) i) y = …….. ii) x = ……

d) x = ……, ……

c) From your graph, find

i. the value of y when $x = 1.6$

ii. the value of x when $y = 7.5$

d) Draw a suitable straight line on your graph to find all the values of x which satisfies the equation $3x^2 = 19x - 10$ for $-1 \le x \le 6$. State these values of x.

8. a) Complete Table 1 in the answer space for the equation $y = \frac{24}{x}$ by writing down the values of y when x = -3 and x = 1.5.

x	-4	-3	-2	-1	1	1.5	2	3	4
y	-6		-12	-24	24		12	8	6

Table 1

b) For this part of the question, use the graph paper. You may use a flexible curve rule.
By using a scale of 2 cm to 1 unit on the x-axis and 2 cm to 5 units on the y-axis,
draw the graph of $y = \frac{24}{x}$ for -4 ≤ x ≤ 4.

Answer:
a) y = ……, ……
c) i) y = …….. ii) x = ……
d) x = ……, ……

c) From your graph, find
i. the value of y when x = 2.9
ii. the value of x when y = -13

d) Draw a suitable straight line on your graph to find a value of x which satisfies the equation $2x^2 + 5x = 24$ for -4 ≤ x ≤ 4.
State the value of x.

9. a) Complete Table 2 in the answer space for the equation $y = 2x^2 – x - 3$.

x	-2	-1	-0.5	1	2	3	4	4.5	5
y	7		-2	-2	3	12		33	42

Table 2

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b) For this part of the question, use the graph paper. You may use a flexible curve rule.
By using a scale of 2 cm to 1 unit on the x-axis and 2 cm to 5 units on the y-axis,
draw the graph of $y = 2x^3 – x - 3$ for -2 ≤ x ≤ 5.

Answer:
a) y = ……, ……
c) i) y = …….. ii) x = ……
d) x = ……, ……

c) From your graph, find
i. the value of y when x = 3.6
ii. the value of x when y = 37

d) Draw a suitable straight line on your graph to find all the values of x which satisfies the equation $2x^2 - 3x = 10$ for -2 ≤ x ≤ 5.
State these values of x.

10. a) Complete Table 1 in the answer space for the equation $y = \frac{-4}{x}$ by writing down the values of y when x = -1 and x = 2.

x	-4	-2.5	-1	-0.5	0.5	1	2	3.2	4
y	1	1.6		9	-8	-4		-1.25	-1

Table 1

b) For this part of the question, use the graph paper. You may use a flexible curve rule.
By using a scale of 2 cm to 1 unit on the x-axis and 2 cm to 2 units on the y-axis, draw the graph of $y = \frac{-4}{x}$ for -4 ≤ x ≤ 4.

Answer:

h) y = ……, …….

c) i) y = …….. ii) x = ……

d) x = ……, …….

c) From your graph, find
i. the value of y when x = 1.8
ii. the value of x when y = -3.4

d) Draw a suitable straight line on your graph to find a value of x which satisfies the equation $\frac{4}{x} = 2x + 3$ for -4 ≤ x ≤ 4.
State these values of x.

11. a) Complete Table 2 in the answer space for the equation $y = 6 - x^3$

x	-3	-2.5	-2	-1	0	1	2	2.5
y	33	21.63	14		6	5		-9.63

Table 2

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b) For this part of the question, use the graph paper. You may use a flexible curve rule.
By using a scale of 2 cm to 1 unit on the x-axis and 2 cm to 5 units on the y-axis, draw the graph of $y = 6 - x^3$ for -3 ≤ x ≤ 2.5.

Answer:

i) y = ……, …….

c) i) y = …….. ii) x = ……

d) x = ……, …….

c) From your graph, find
i. the value of y when x = 1.5
ii. the value of x when y = 10

d) Draw a suitable straight line on your graph to find all the values of x which satisfies the equation $x^3 - 8x - 6 = 0$ for -3 ≤ x ≤ 2.5. State these values of x.