Quadratic Graphs Exam Practice

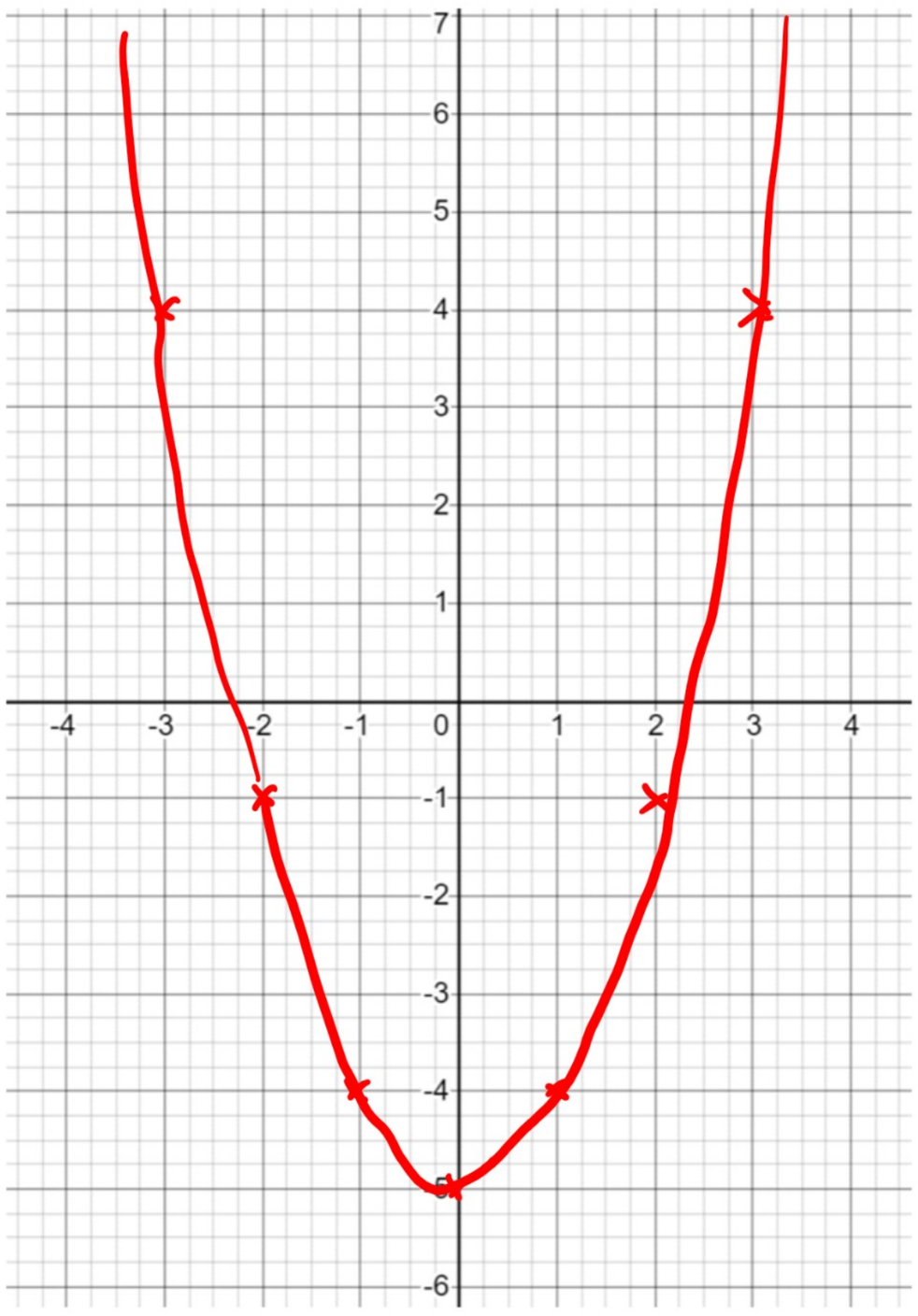
Q1. Complete the table of values for $y = x^2 - 5$

a)

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

(3 marks)

b) On the grid below, draw the graph of $y = x^2 - 5$



(3 marks)

c) Use the graph to estimate the solutions of the equation $x^2 - 5 = 0$

anything in interval $x = -2.3$ to -2.1,
anything in interval $x = 2.1$ to 2.3

Answer: _____

(3 marks)

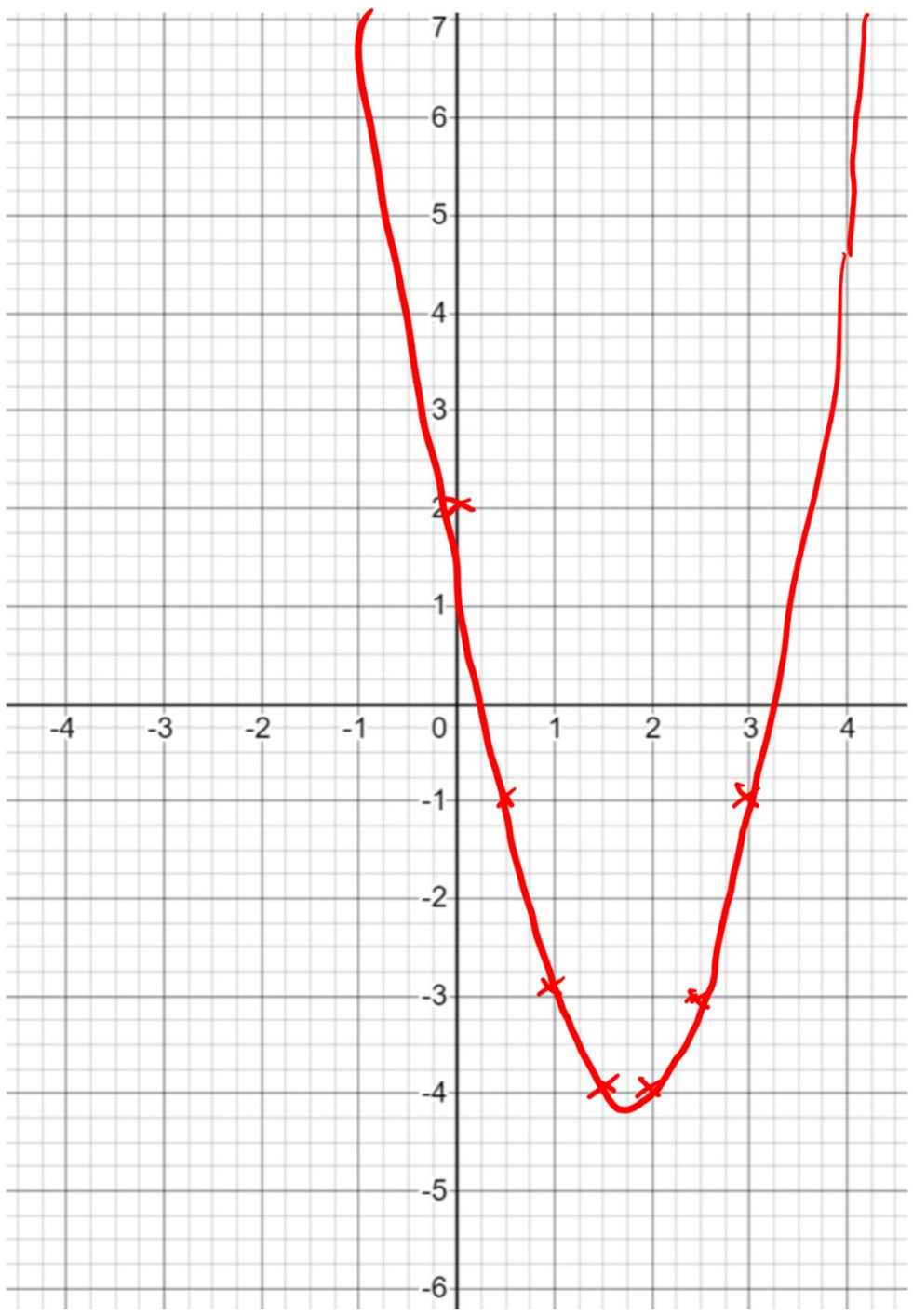
Q2. Complete the table of values for $y = 2x^2 - 7x + 2$

a)

x	0	0.5	1	1.5	2	2.5	3
y	2	-1	-3	-4	-4	-3	-1

(3 marks)

b) On the grid below, draw the graph of $y = 2x^2 - 7x + 2$



(3 marks)

c) Use the graph to estimate the solutions of the equation $2x^2 - 7x + 2 = 0$

– any value in the interval $x = 0$ to 0.5,
– any value in the interval $x = 3.0$ to 3.5

Answer: $x = 0.314$, $x = 3.186$

(3 marks)

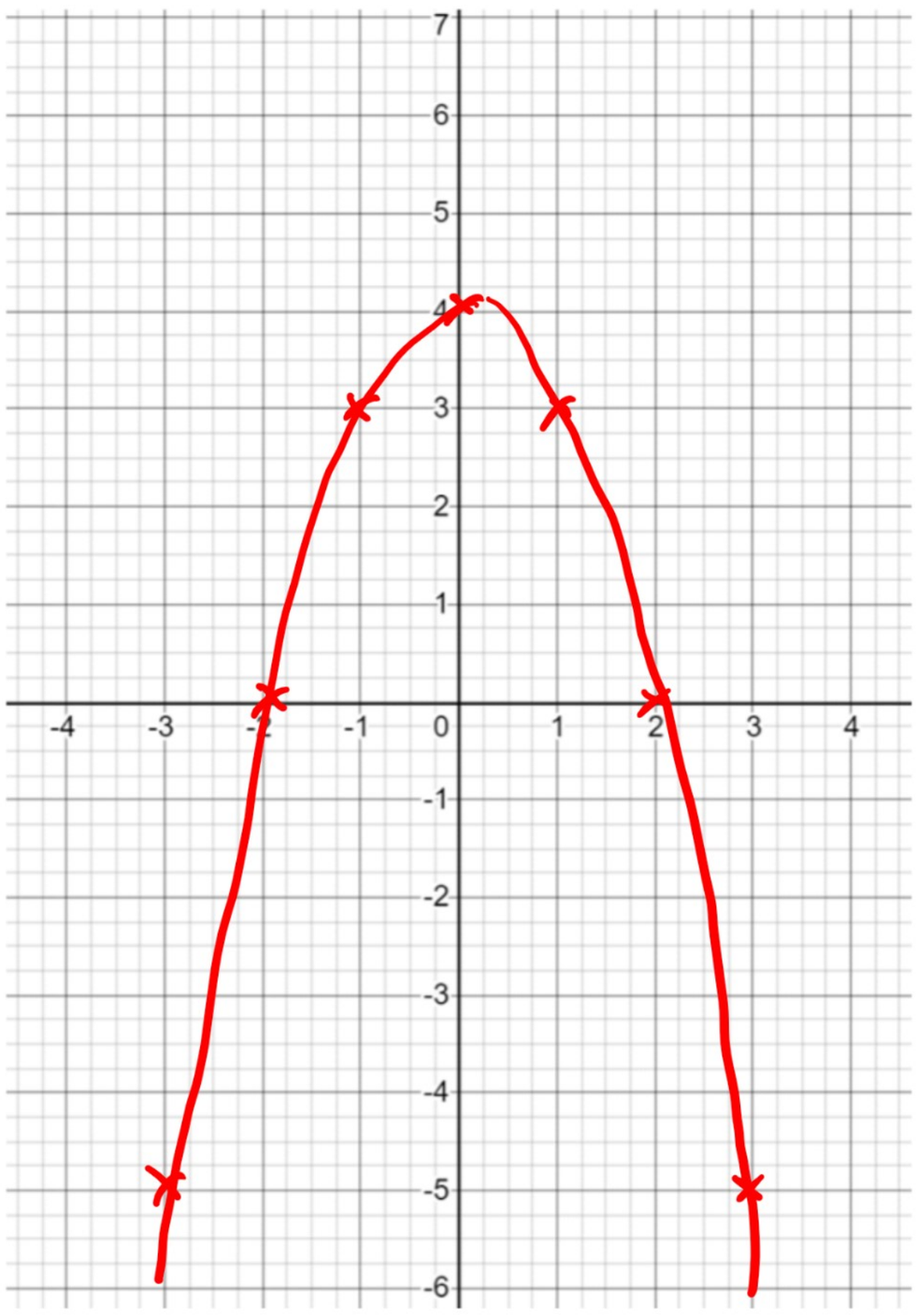
Q3. Complete the table of values for $y = 4 - x^2$

a)

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

(3 marks)

b) On the grid below, draw the graph of $y = 4 - x^2$



(3 marks)

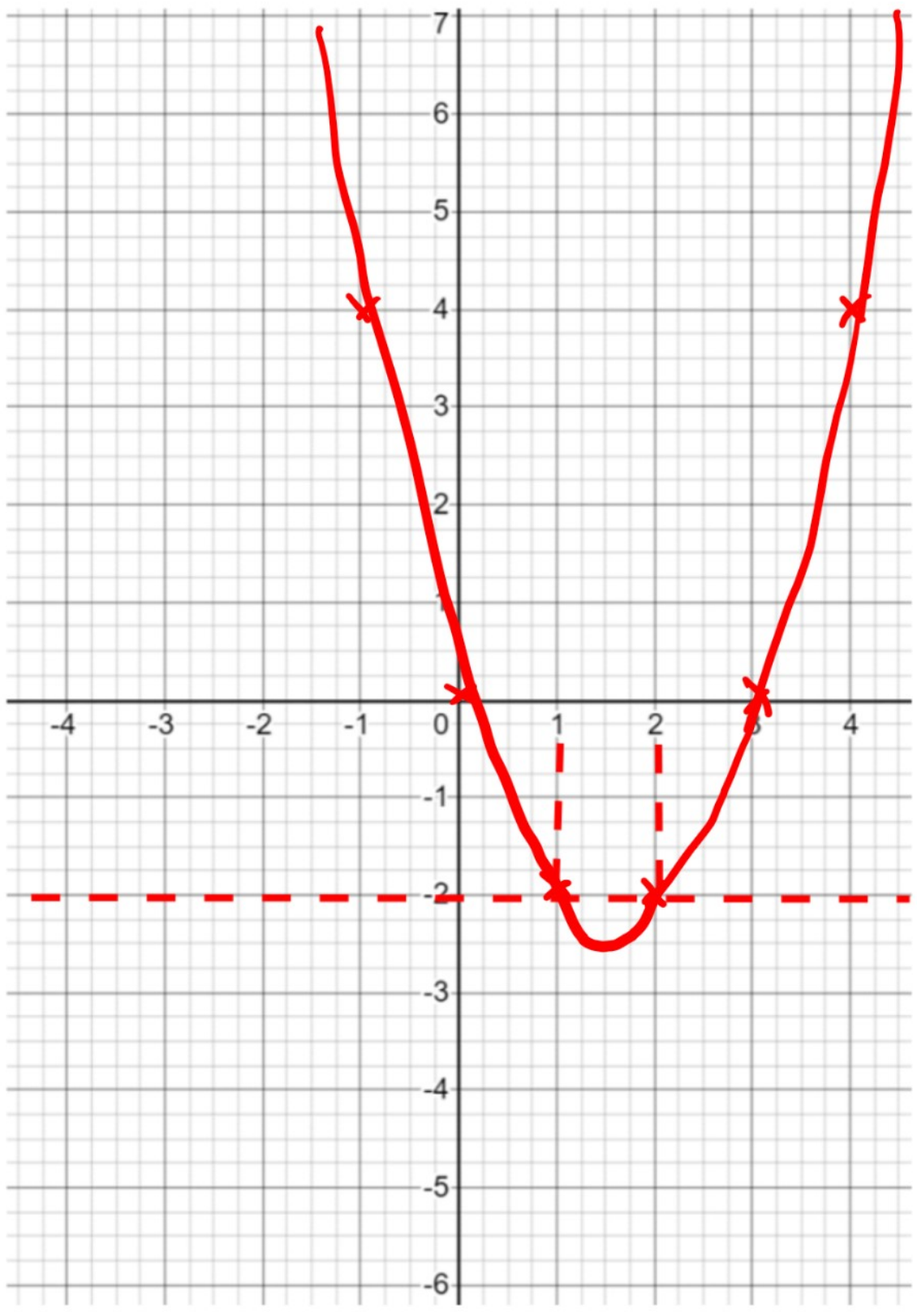
c) Use the graph to estimate the solutions of the equation $4 - x^2 = 0$

$x = -2, \quad x = 2$

Answer: $x = -2, x = 2$

(3 marks)

Q4. a) On the grid below, draw the graph of $y = x(x - 3)$



$y = x^2 - 3x$

x	-3	-2	-1	0	1	2	3	4
y	18	10	4	0	-2	-2	0	4

(6 marks)

b) Use the graph to estimate the solutions of the equation $x^2 - 3x + 2 = 0$

- $x^2 - 3x + 2 = 0 \Rightarrow x^2 - 3x = -2$

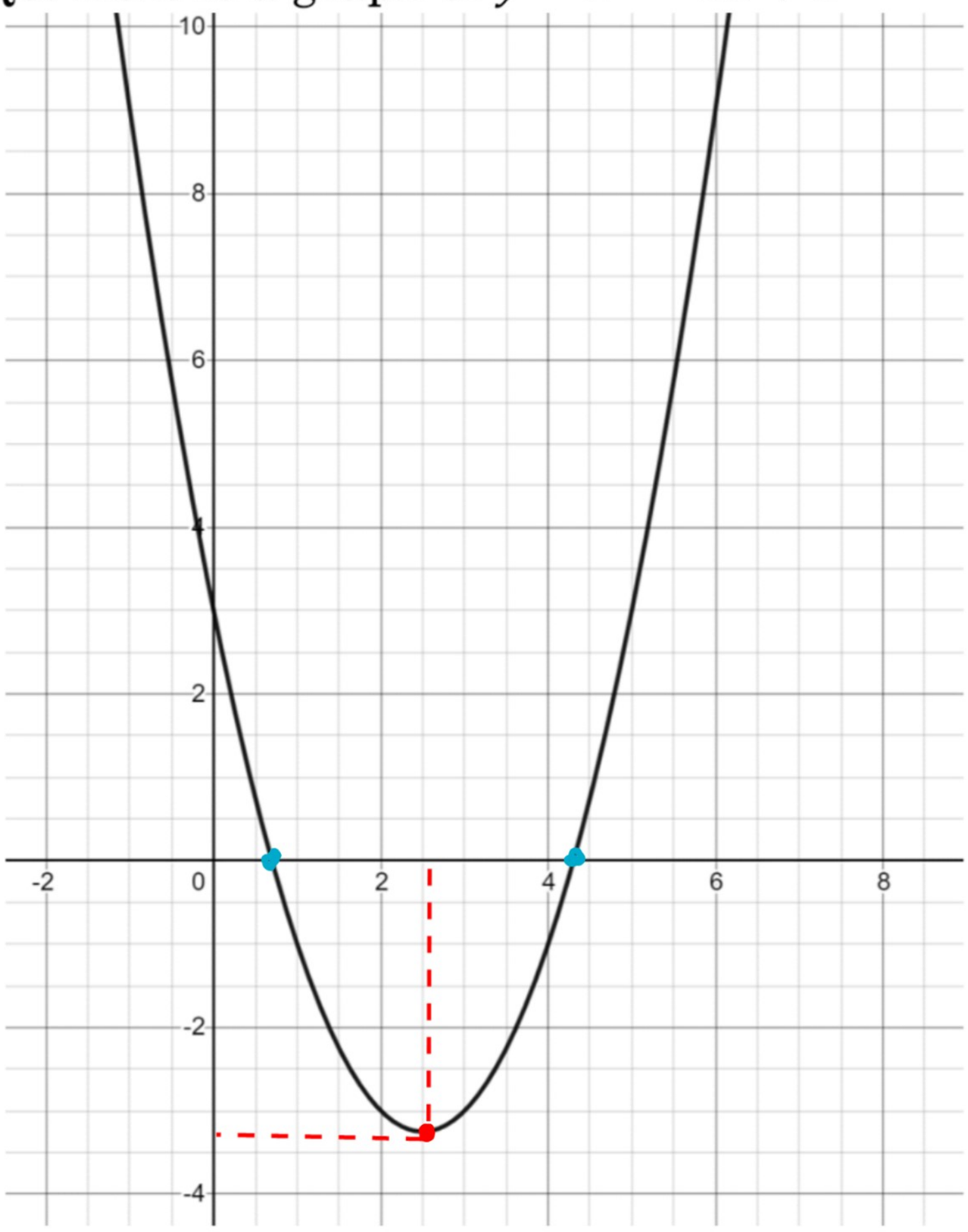
  i.e. where $y = x^2 - 3x$ and $y = -2$ meet

- $x = 1, x = 2$

Answer: $x = 1, x = 2$

(3 marks)

Q5. Here is a graph of $y = x^2 - 5x + 3$



a) Use the graph to estimate the solutions of the equation $x^2 - 5x + 3 = 0$

any value in the interval $x = 0.5$ to $x = 1.0$
any value in the interval $x = 4.0$ to 4.5

Answer: $x = 0.697, x = 4.303$

(3 marks)

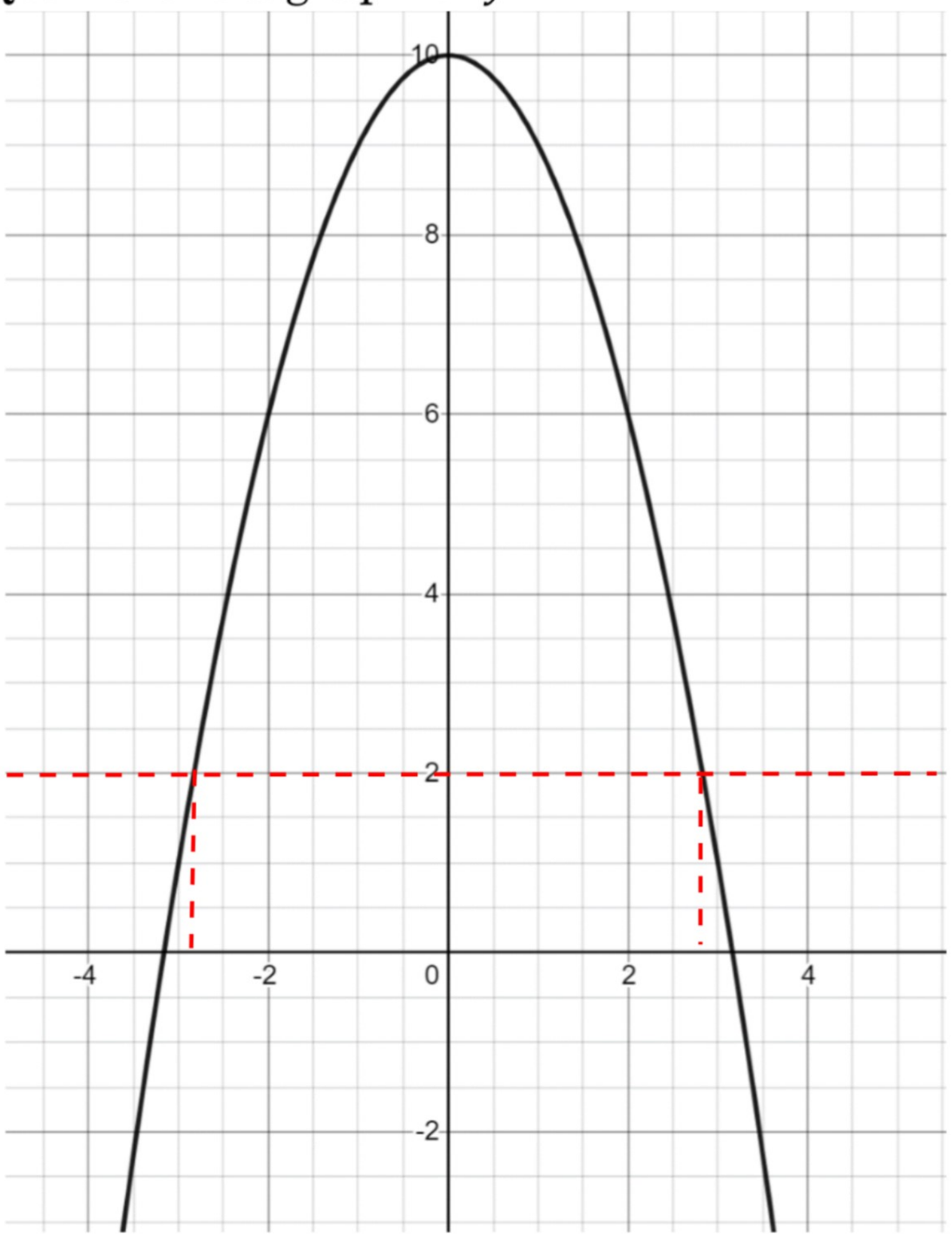
b) Use the graph to estimate the turning point of the graph $y = x^2 - 5x + 3$

allow $x = 2.5$ only and for the y-coordinate
any value in the interval -3.0 to -3.5

Answer: $(2.5, -3.25)$

(3 marks)

Q6. Here is a graph of $y = 10 - x^2$



a) Use the graph to estimate the solutions of the equation $10 - x^2 = 2$

any value in the interval $x = -2.5$ to -3.0,
any value in the interval $x = 2.5$ to 3.0

Answer: $x = -8.28$, $x = 8.28$

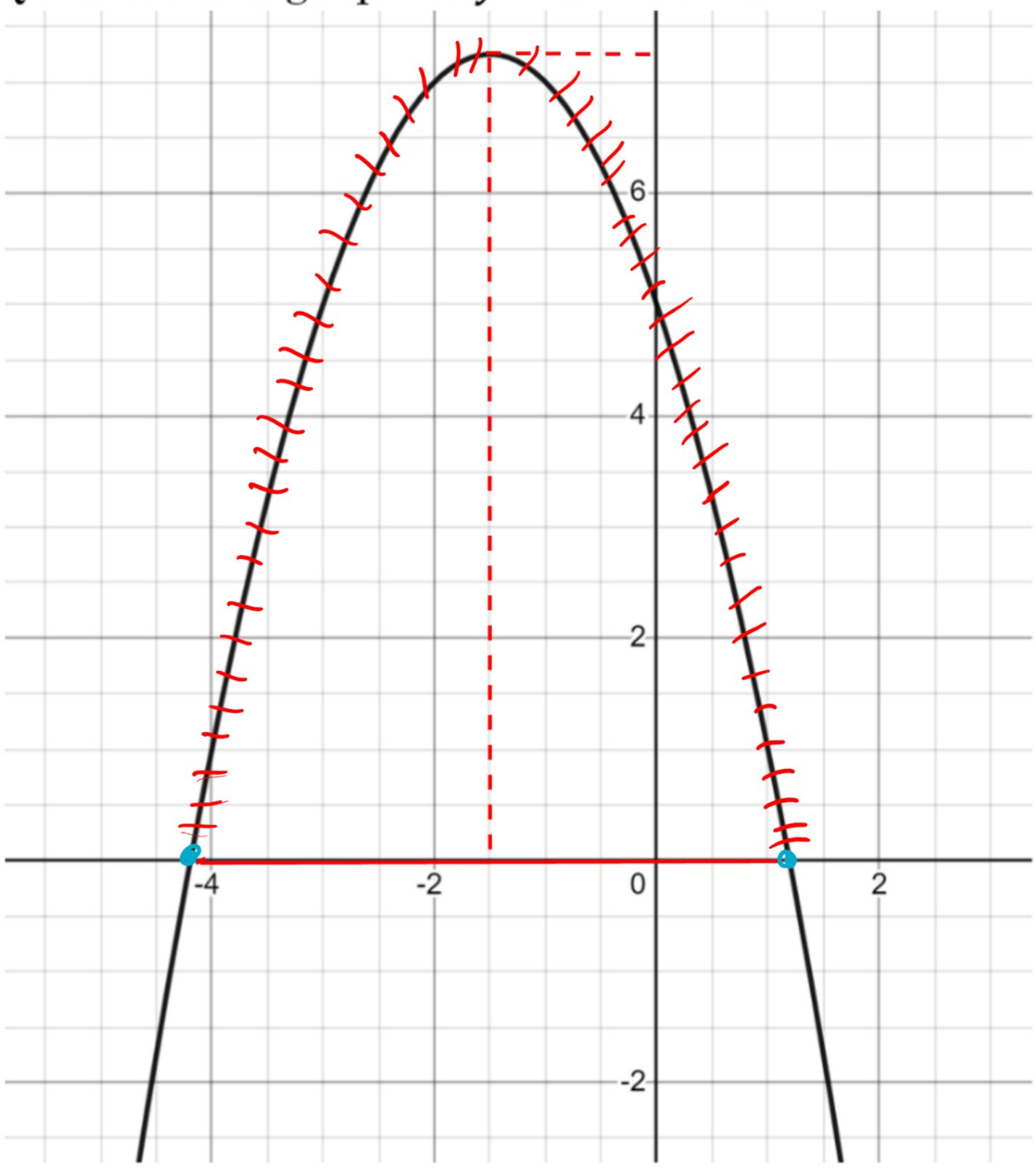
(3 marks)

b) Use the graph to estimate the turning point of the graph $y = 10 - x^2$

Answer: $(0, 10)$

(3 marks)

Q7. Here is a graph of $y = 5 - 3x - x^2$



a) Use the graph to estimate the solutions of the equation $5 - 3x - x^2 \geq 0$

$a \leq x \leq b$, where :

a is anywhere in the interval -4.0 to -4.5

b is anywhere in the interval 1.0 to 1.5

Answer: $-4.193 \leq x \leq 1.193$

(3 marks)

b) Use the graph to estimate the turning point of the graph $y = 5 - 3x - x^2$

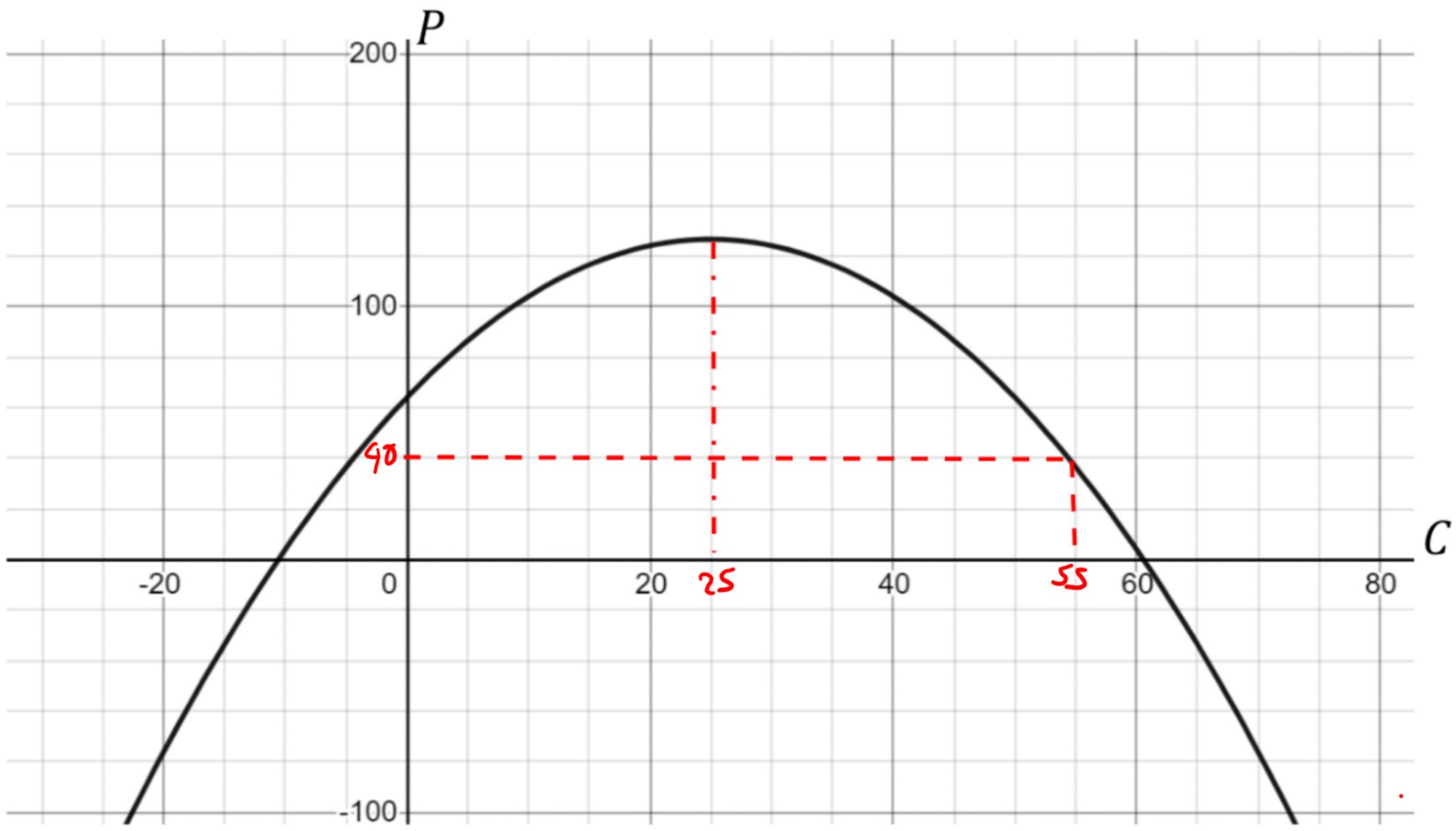
$x = -1.5$; for the y-coordinate any value in the interval $y = 7.0$ to 7.5

Answer: $(-1.5, 7.25)$

(3 marks)

Applied Problem Solving

Q8. SportsZone model the cost C (£) they charge for their best-selling tennis racket against their annual company profit P (£, 1000's).



a) Use the graph to estimate the price SportZone should charge to make a profit of £40,000.

£55

Answer: £55

(2 marks)

b) Use the graph to estimate the optimal price SportsZone should charge for the racket.

£25

Answer: £25

(2 marks)

c) Give 2 reasons why Sportzone's model is unrealistic.

- The profit for a sale price of £0 is higher than the profit they make for a selling price of £55 for example – unrealistic.
- The model includes negative values for the price which no sense.

Answer:

(2 marks)