

1.12 - EQ - 3.2 Standard Form

Use the following information to answer Q1-Q4:

$$f(x) = -\frac{1}{2}x^2 - 2x + 6$$

Negative... opens down

y-intercept is +6

Q1: The function opens i, and has a y-intercept of ii.

	i	ii
A.	Up	-6
B.	Up	+6
C.	Down	-6
<b>D.</b>	Down	+6

Q2: The zeroes of the function are  $x = -a$ ,  $x = b$ , where  $a$  and  $b$  are \_\_\_ and \_\_\_.

(Record your two-digit answer in the Numerical Response boxes below)

6	2		
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x-intercept/zeroes  $\rightarrow$  Set  $y=0$ 

$$0 = -\frac{1}{2}x^2 - 2x + 6$$

$$\cdot(-2) \cdot(-2) \cdot(-2) \cdot(-2)$$

$$0 = x^2 + 4x - 12$$

$$0 = (x-2)(x+6)$$

$$x-2=0$$

$$+2 +2$$

$$x=2$$

$$x+6=0$$

$$-6 -6$$

$$x=-6$$

$$\begin{aligned} -2 + 6 \\ \square + \square = 4 \\ \square \times \square = -12 \end{aligned}$$

2 marks Q3: Determine the coordinates of the vertex. (2 marks)

Axis of symmetry is halfway between the zeroes.

$$\frac{(2) + (-6)}{2} = -2$$

Axis of symmetry is  $x = -2$ 

Vertex occurs on axis of symmetry.

$$f(x) = -\frac{1}{2}(x^2) - 2(x) + 6$$

$$f(-2) = -\frac{1}{2}(-2)^2 - 2(-2) + 6$$

$$= -\frac{1}{2}(4) - 2(-2) + 6$$

$$= -2 + 4 + 6$$

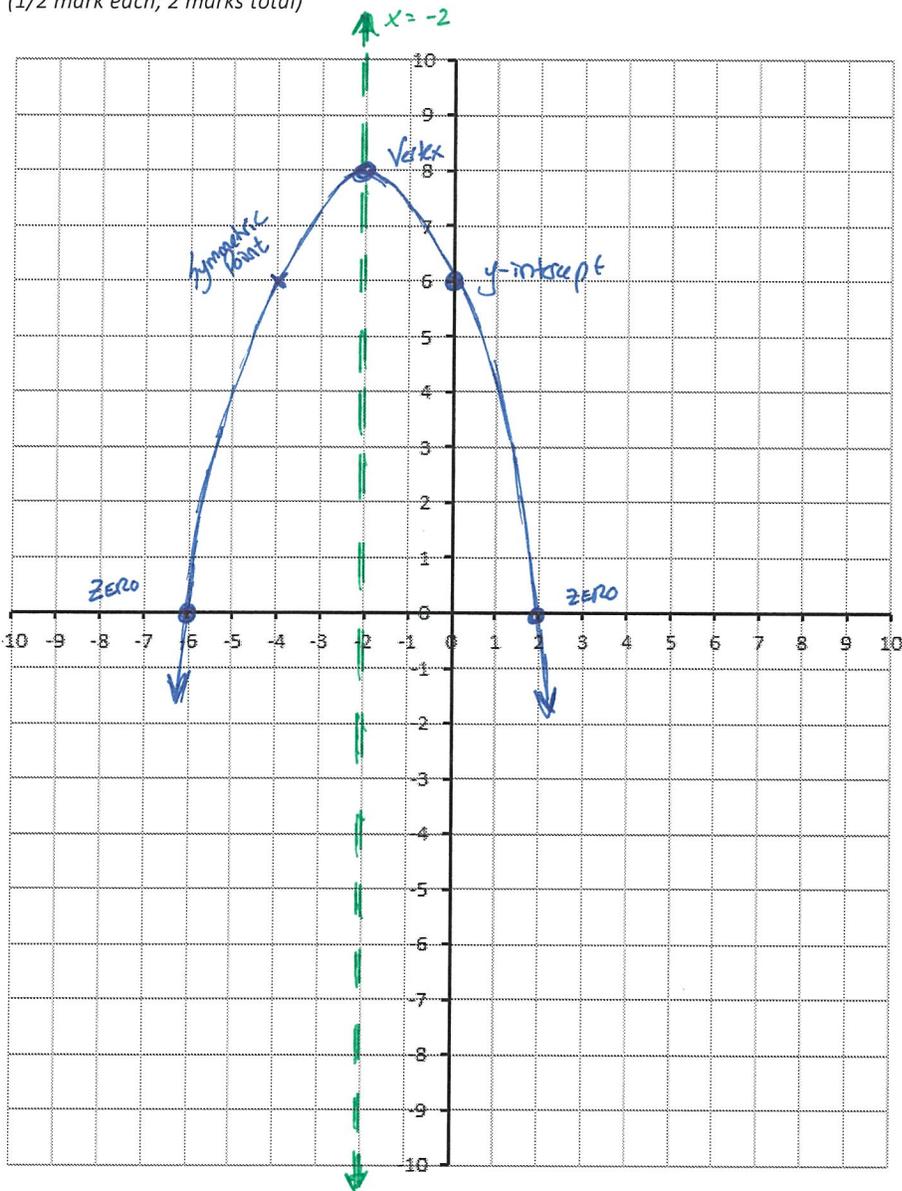
$$= 8$$

Vertex at  $(-2, 8)$

Q4: Sketch the graph, labelling (a) Vertex, (b) Zeroes, (c) y-Intercept, and (d) Axis of Symmetry.

(1/2 mark each; 2 marks total)

2 marks



**MARKING:**

Beginning	0.0 – 2.5
Progressing	3.0 – 4.0
Competent	4.5 – 5.5
Exemplary	6.0