Math 20-1

KEY

L11 – FQ – 3.2 Standard Form

Use the following information to answer Q1-Q4:

Negative ... opens down.

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

y-intercept is +6

1 mark **Q1:** The function opens __i__, and has a y-intercept of __ii__.

	i	ii
A.	Up	-6
B.	Up	+6
C.	Down	-6
(D)	Down	+6

1 mark **Q2:** The zeroes of the function are $x = -a$ (-6), $x = b$ (2), where ***a*** and ***b*** are ___ and ___.

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

6	2		

x-intercept → set $y = 0$

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

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

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

$-2 \quad +6$

$\square + \square = 4$

$\square \times \square = -12$

1, 12
2, 6
3, 4

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

$x - 2 = 0$; $x + 6 = 0$

$x = 2$; $x = -6$

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 $(-2, 8)$

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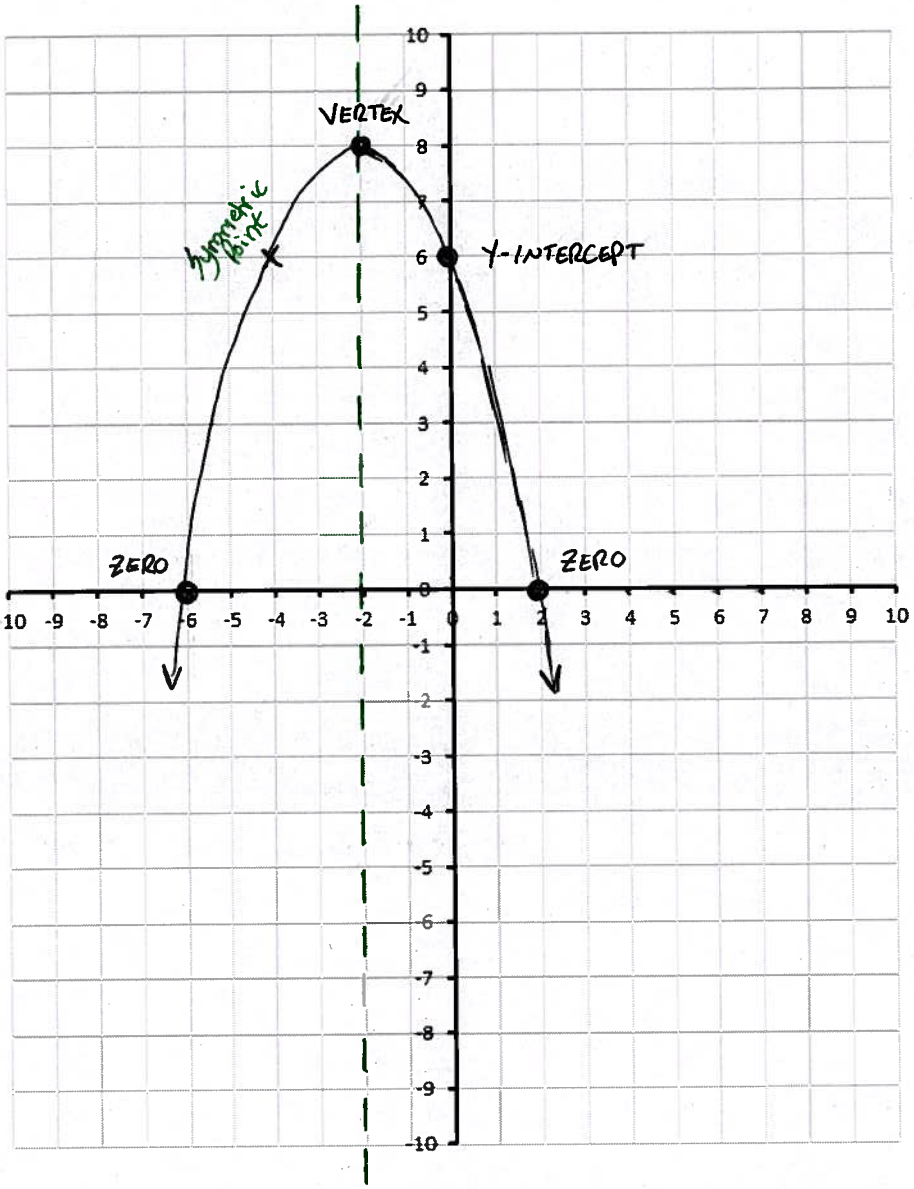
½ ½ ½ ½

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