Marked example 2

Paper 1 style · No calculator

2 7 marks AHL 2.15 ●●○ Typical

Let $f(x) = x^2 - 2x - 3$.

(a) Find the x-intercepts of the graph of $y = f(x)$, and the coordinates of its vertex. **[2]**

(b) Hence write down the coordinates of the local maximum point of the graph of $y = |f(x)|$. **[1]**

(c) Solve the equation $|f(x)| = 3$. **[4]**

MARKSCHEME (a)

$x = -1,\ x = 3$ — A1

vertex $(1,\ -4)$ — A1

Total 2 marks

MARKSCHEME (b)

$(1,\ 4)$ — A1

Total 1 mark

MARKSCHEME (c)

$f(x) = 3$ or $f(x) = -3$ — M1

$x^2 - 2x - 6 = 0$: $x = 1 \pm \sqrt{7}$ — A1

$x^2 - 2x = 0$: $x = 0,\ x = 2$ — A1

four solutions: $1 - \sqrt{7},\ 0,\ 2,\ 1 + \sqrt{7}$ — A1

Total 4 marks

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