

Doubles assignment Tracking Test 1 part B
(50 minutes)

Name _____

% Prediction before: _____

% Prediction after: _____



4) Given

$$f(x) = x^2(x + 3)$$

- a) Sketch $y = f(x)$. Clearly show the coordinates of any points that the curve meets the coordinate axes
(2 marks)

Given

$$g(x) = (x - k)^2(x - k + 3)$$

- b) Sketch $y = g(x)$. Clearly show the coordinates, in terms of k , of any points that the curve meets the coordinate axes
(3 marks)


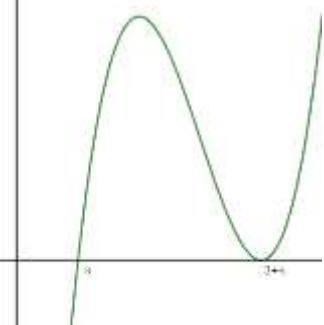
- c) Given that the point $(1,0)$ lies on the graph with equation $y = g(x)$ determine, two possible values of k .


(2 marks)







1a	$1 - x = x^2 - 6x + 10$ $x^2 - 5x + 9 = 0$ $b^2 - 4ac = 25 - 36 < 0$ $\therefore \text{no solutions}$	M1 A1 A1 A1
1b	$x^2 - 6x + 10 > 4 - x$ $x^2 - 5x + 6 > 0$ $(x - 3)(x - 2) > 0$ $x > 3, x < 2$	M1 A1 M1A1
2	$m = -\frac{3}{2}$	B1
	$A: \left(-\frac{1}{3}, -1\right)$ $B: (5, -1)$ $\text{Area} = \frac{1}{2} \left(5 + \frac{1}{3}\right) \left(\frac{13}{3} + 1\right)$	M1 A1 M1A1
3	$\frac{2x}{x}(x + 1 + 2x + 1) = 16$ $3x^2 + 2x - 16 = 0$ $(3x + 8)(x - 2) = 0$ $x = 2$ $CB^2 = (2x)^2 + x^2$ $CB^2 = 16 + 4$ $CB = \sqrt{20}$ $= 2\sqrt{5}$	M1 A1 M1 A1 M1A1 A1 A1
4		B1 (Shape, cross x axis once) B1 both s coordinates marked
		B1 Shape translated right direction B1 crosses at k - marked B1 touches at 3+k - marked
	$0 = (1 - k)^2(4 - k)$ $k = 1, k = 4$	M1 A1
	$A: h = 4.9t$ $B: h = 10.78(t - 1) + 4.9(t - 1)^2$ $4.9t = 10.78(t - 1) + 4.9(t - 1)^2$ $t = 6$ $h = 176.4$	M1 For either equation A1 for both equations M1A1 M1A1

		<p>B1 Shape B1 Coordinates</p>
	$1368 = 17(30) + (53 - T)(12) + \frac{1}{2}T(30 + 12)$ $T = 24$ $m = \frac{30 - 12}{24} = 0.75$	<p>M1 A1 M1A1</p>