Doubles assignment Tracking Test 1 part B (50 minutes)

Name_____

<u>% Prediction before:</u>

<u>% Prediction after:</u>_____

1) Given

$$f(x) = 1 - x$$
$$g(x) = x^2 - 6x + 10$$

a	a)	Show that the graphs, $y = f(x)$ and $y = g(x)$	do not intersect.	(3 marks)
b))	Find the set of x values that satisfy the inequ	ality	(5 11/1/(5)
			g(x) > f(x) + 3	(4 marks)

2) The straight lines l_1 and l_2 with respective equations

y = 3x3x + 2y = 13

intersect at the point *P*.

a) Determine the gradient of l_2

(1 mark)

Given that he lines l_1 and l_2 intersect at the line y = -1 at the points A and B respectively

b) Find that the area of the triable *ABP*, leave your answer in the form $\frac{a}{b}$, where *a* and *b* are integers

(4 marks)



3) A right angled trapezium *ABCD* is shown in the figure below.



The trapezium has parallel sides *AB* and *CD* of lengths (2x + 1)cm and (x + 1)cm. The height of the trapezium is 2x cm.

Given that the area of the trapezium is $16 cm^2$, determine the exact length of *BC*. Leave your answer in the form $a\sqrt{b}$, where *a* and *b* are integers.

(8 marks)

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)

5) A particle is released from rest from a point h m above level horizontal ground. One second later, another particle *B* is projected vertically downwards with speed $10.78ms^{-1}$ from the same point *A* was released. Given that the particles reach the ground at the same time, determine the value of *h*.

(6 marks)

- 6) A car is observed travelling along a straight horizontal road between two points on a road, A and B, where AB = 1362m. At time t = 0 s the car goes past point A with speed $30ms^{-1}$. The car maintains this speed for 17s. The car decelerates uniformly to a speed of $12ms^{-1}$. The car maintains the speed of $12ms^{-1}$ until it goes past B. The car took 70 s to travel from A to B
- a) Sketch a speed time graph to show the motion of the car from A to B.

(2 marks)

b) Calculate the deceleration of the car during the motion described above.

(4 marks)

1a	$1 - x = x^2 - 6x + 10$ $x^2 - 5x + 9 = 0$	M1 A1
	$b^2 - 4ac = 25 - 36 < 0$	A1
	\therefore no solutions	A1
1b	$x^2 - 6x + 10 > 4 - x$	
	$x^2 - 5x + 6 > 0$ (x - 3)(x - 2) > 0	Δ1
	x > 3, x < 2	M1A1
2	$m = -\frac{3}{2}$	
	<i>m</i> – 2	B1
	$A:\left(-\frac{1}{2},-1\right)$	M1 Δ1
	B:(5,-1)	M1A1
	$Area = \frac{1}{2} \left(5 + \frac{1}{2} \right) \left(\frac{13}{2} + 1 \right)$	
0	2 (3/ (3 /)	N 41
3	$\frac{2x}{x}(x+1+2x+1) = 16$	MI
	$3x^2 + 2x - 16 = 0$	A1
	(3x+8)(x-2) = 0	M1
	x = 2 $CR^2 = (2x)^2 + x^2$	
	$CB^{2} = 16 + 4$	WIAI
	$CB = \sqrt{20}$	A1
	$=2\sqrt{5}$	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
	$0 = (1 - k)^2 (4 - k)$	M1
	k = 1, k = 4	A1
		M1 For either equation
	A: h = 4.9t $B: h = 10.78(t - 1) + 4.9(t - 1)^{2}$	A I for both equations
	$4.9t = 10.78(t-1) + 4.9(t-1)^2$	
	t = 6	M1A1
	h = 176.4	
1		

