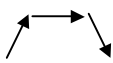


	Give 1 mark for each •	Illustration(s) for awarding each mark
1	D	Award 2 marks for each correct answer  <b>10 marks</b>
2	B	
3	C	
4	B	
5	A	
6(a)	ans: $y + 2x = 7$ (3 marks)	
	$\frac{1}{-}$ knows to find gradient of AB	$\frac{1}{-} m_{AB} = \frac{y_2 - y_1}{x_2 - x_1}$
	$\frac{2}{-}$ finds gradient	$\frac{2}{-} m_{AB} = \frac{-2 - 2}{-3 + 5} = -2$
	$\frac{3}{-}$ substitutes values in equation	$\frac{3}{-} y + 1 = -2(x - 4)$
(b)	ans: $y + 7x = -33$ (3 marks)	
	$\frac{1}{-}$ finds gradient of BC	$\frac{1}{-} m_{BC} = \frac{-1 + 2}{4 + 3} = \frac{1}{7}$
	$\frac{2}{-}$ takes perpendicular gradient	$\frac{2}{-} m_{PERP} = -7$
	$\frac{3}{-}$ substitutes values in equation	$\frac{3}{-} y - 2 = -7(x + 5)$
(c)	ans: $(-8, 23)$ (4 marks)	
	$\frac{1}{-}$ knows to use simultaneous equations	$\frac{1}{-}$ evidence
	$\frac{2}{-}$ finds value for $x$	$\frac{2}{-} x = -8$
	$\frac{3}{-}$ finds value for $y$	$\frac{3}{-} y = 23$
	$\frac{4}{-}$ states coordinates	$\frac{4}{-} (-8, 23)$
7(a)	ans: $-x$ (2 marks)	
	$\frac{1}{-}$ substitutes	$\frac{1}{-} g(3 - x)$
	$\frac{2}{-}$ simplifies	$\frac{2}{-} 3 - x - 3 = -x$
(b)	ans: proof (2 marks)	
	$\frac{1}{-}$ finds expression for $f(g(x))$	$\frac{1}{-} 3 - (x - 3) = 3 - x - 3 = 6 - x$
	$\frac{2}{-}$ simplifies to answer	$\frac{2}{-} -x - (6 - x) = -6$

	Give 1 mark for each •	Illustration(s) for awarding each mark
<b>8(a)</b>	<b>ans: <math>a = 0.8</math> ; <math>b = -2</math> (3marks)</b> $\frac{1}{-}$ forms a system of equations $\frac{2}{-}$ finds value for $a$ $\frac{3}{-}$ finds value for $b$	$\frac{1}{-}$ $9 \cdot 2 = 14a + b$ ; $5 \cdot 36 = 9 \cdot 2a + b$ $\frac{2}{-}$ $a = 0.8$ $\frac{3}{-}$ $b = -2$
<b>(b)</b>	<b>ans: <math>-1 &lt; 0.8 &lt; 1</math> (1 mark)</b> $\frac{1}{-}$ states condition for limit	$\frac{1}{-}$ $-1 < 0.8 < 1$
<b>(c)</b>	<b>ans: 20 (2 marks)</b> $\frac{1}{-}$ substitutes for $U_2$ $\frac{2}{-}$ solves for $U_1$	$\frac{1}{-}$ $U_2 = 0.8 U_1 - 2$ ; $14 = 0.8 U_1 - 2$ $\frac{2}{-}$ $0.8 U_1 = 16$ ; $U_1 = 20$
<b>9</b>	<b>ans: <math>y = 9x - 16</math> (5 marks)</b> $\frac{1}{-}$ knows to differentiate $\frac{2}{-}$ finds derivative $\frac{3}{-}$ substitutes $x = 2$ in derivative $\frac{4}{-}$ finds point on the line $\frac{5}{-}$ substitutes in equation	$\frac{1}{-}$ $\frac{dy}{dx} =$ $\frac{2}{-}$ $3x^2 - 3$ $\frac{3}{-}$ $3(2)^2 - 3 = 9$ $\frac{4}{-}$ $y = (2)^3 - 3(2) = 8 - 6 = 2$ ; $(2, 2)$ $\frac{5}{-}$ $y - 2 = 9(x - 2)$
<b>10</b>	<b>ans: <math>3(x - 1)^2 + 8</math> (3marks)</b> $\frac{1}{-}$ takes common factor $\frac{2}{-}$ completes square in bracket $\frac{3}{-}$ simplifies	$\frac{1}{-}$ $3(x^2 - 2x) + 11$ $\frac{2}{-}$ $3[(x - 1)^2 - 1] + 11$ $\frac{3}{-}$ $3(x - 1)^2 - 3 + 11 = 3(x - 1)^2 + 8$
<b>11(a)</b>	<b>ans: <math>k = 3</math> (1 mark)</b> $\frac{1}{-}$ substitutes and solves for $k$	$\frac{1}{-}$ $k = \log_5 125$ ; $k = 3$
<b>(b)</b>	<b>ans: <math>a = 3</math> (1 mark)</b> $\frac{1}{-}$ substitutes and solves for $a$	$\frac{1}{-}$ $9 = a^2$ ; $a = 3$

	Give 1 mark for each •	Illustration(s) for awarding each mark
(a)	<b>ans: proof (2 marks)</b> _ <sup>1</sup> finds expression for S.A. _ <sup>2</sup> rearranges to answer	_ <sup>1</sup> $x^2 + 4xh = 1350$ _ <sup>2</sup> $4xh = 1350 - x^2 ; h = \frac{1350 - x^2}{4x}$
(b)	<b>ans: proof (3 marks)</b> _ <sup>1</sup> finds expression for volume _ <sup>2</sup> cancels _ <sup>3</sup> completes rearranging	_ <sup>1</sup> $V = x \times x \times \left( \frac{1350 - x^2}{4x} \right)$ _ <sup>2</sup> $V = x \times \left( \frac{1350 - x^2}{4} \right)$ _ <sup>3</sup> $V = \frac{1}{4}x(1350 - x^2)$
(c)	<b>ans: <math>15\sqrt{2}</math> (5 marks)</b> _ <sup>1</sup> knows to differentiate and equal 0 _ <sup>2</sup> differentiates _ <sup>3</sup> solves for $x$ _ <sup>4</sup> expresses as a surd _ <sup>5</sup> justifies answer	_ <sup>1</sup> $\frac{dV}{dx} = 0$ _ <sup>2</sup> $\frac{1350}{4} - \frac{3}{4}x^2$ _ <sup>3</sup> $x = \sqrt{450}$ _ <sup>4</sup> $15\sqrt{2}$ _ <sup>5</sup> or other acceptable method 
		Total: 50 marks