Question Number	Scheme	Marks
4 (a)	$2\times4^{x}-2^{x+3}=17\times2^{x-1}-4$	
	Uses an index law and states or implies any of $4^{x}=p^{2},\ 2^{x+3}=8p$ or $2^{x-1}=\frac{p}{2}$	B1
	Writes the given equation in terms of p $2\times4^{x}-2^{x+3}=17\times2^{x-1}-4\Rightarrow 2p^{2}-2^{3}\times p=\frac{17p}{2^{1}}-4$	M1
	Proceeds to $4p^{2}-33p+8=0$ via $2p^{2}-8p=\frac{17p}{2}-4$ * CSO	A1*
		(3)
(b)	$4p^{2}-33p+8=0\Rightarrow(4p-1)(p-8)=0\Rightarrow p=...,...$	M1
	Sets $2^{x}=\frac{1}{4},8\Rightarrow x=...$	M1
	$x=-2,3$	A1
		(3)
		(6 marks)

Question	Scheme	Marks
6(a)	$2xy-3x^{2}=50;\ y-x^{3}+6x=0$	
	$\Rightarrow 2x\left(x^{3}-6x\right)-3x^{2}=50$	**M1**
	$\Rightarrow 2x^{4}-12x^{2}-3x^{2}-50=0\Rightarrow 2x^{4}-15x^{2}-50=0$* CSO	**A1***
		(2)
(b)	$\Rightarrow\left(2x^{2}+5\right)\left(x^{2}-10\right)=0\Rightarrow x^{2}=...$	**M1**
	So $x^{2}=10$	**A1**
	$\Rightarrow y=\left(\sqrt{10}\right)^{3}-6\sqrt{10}=...$	**M1**
	one solution pair is $x=\sqrt{10},y=4\sqrt{10}$	**A1**
	Solutions are $x=\sqrt{10},y=4\sqrt{10}$ and $x=-\sqrt{10},y=-4\sqrt{10}$ CSO	**A1**
		(5)
		(7 marks)

Question Number	Scheme	Marks
11a	$2(x\pm...)^2$	B1
	$...(x\pm3)^2...$	M1
	$2(x-3)^2-4$	A1
		(3)
b	$(3,-4)$	B1ft
		(1)
c	$m=\frac{28--4}{-1-3}\ (=-8)$	M1
	$y-28=-8(x+1)$	dM1
	$y=-8x+20$	A1
		(3)
d	$y\leqslant "-8x+20"$ and $y\geqslant 2x^2-12x+14$ (or $y\geqslant "2(x-3)^2-4"$)	B1ftB1ft
	$y\leqslant -8x+20 \quad y\geqslant 2x^2-12x+14 \quad y\geqslant 0,\ x\geqslant 0$	B1cso
		(3)
		(10 marks)

Question Number	Scheme	Marks
8(a)	$3x^2+6x+9=3(x\pm\ldots)^2\pm\ldots \qquad a=3$	B1
	$3x^2+6x+9=3(x+1)^2\pm\ldots \qquad a=3 \ \&\ b=1$	M1
	$3x^2+6x+9=3(x+1)^2+6$	A1
		(3)
(b)	$(-1,\ 6)$	B1ft
		(1)
(c)	$y=\alpha(x+4)(x+2)(x-3)$	B1
	$6=\alpha(-1+4)(-1+2)(-1-3)$	M1
	$\alpha=-\frac{1}{2}$	A1
	$y="-\frac{1}{2}"(x+4)(x+2)(x-3)\Rightarrow y=\ldots x^3+\ldots x^2+\ldots x+\ldots$	M1
	$A=-\frac{1}{2},\ B=-\frac{3}{2},\ C=5,\ D=12$	A1
		(5)
Alt (c)	$-64A+16B-4C+D=0$ $-8A+4B-2C+D=0$ $27A+9B+3C+D=0$	B1
	$-A+B-C+D=6$	M1
	One of $A=-\frac{1}{2},\ B=-\frac{3}{2},\ C=5,\ D=12$	A1
	Fully solves their simultaneous equations	M1
	$A=-\frac{1}{2},\ B=-\frac{3}{2},\ C=5,\ D=12$	A1
		(9 marks)