Question Number	Scheme	Marks
5. (a)	$20x^3-50x^2-30x=0 \Rightarrow 10x\left(2x^2-5x-3\right)=0$ $\Rightarrow 10x\left(2x+1\right)\left(x-3\right)=0$ $\Rightarrow x=0,-\frac{1}{2},3$	M1 A1, A1 **(3)**
(b)	Sets or implies $\left(y+3\right)^{\frac{1}{2}}=0$ or $-\frac{1}{2}$ or 3	B1ft
	Full method to find y	M1
	$y=6$ $y=-3,\ 6$	A1ft, A1
		(4) **(7 marks)**

(a) **Note the question says using algebra so answers only scores 0 marks.**

M1 For attempting to factorise. They may do this by cancelling/factorising out …x to achieve an expression of the form $Dx(Ax^2+Bx+C)$ where $A,B,C\neq 0$ (but could be 1) and $D=1,2,5$ or 10
If they only have the resulting quadratic $\left(2x+1\right)\left(x-3\right)$ they must state somewhere that $x=0$ (usually as one of their answers)
Equally they may proceed straight to a fully factorised form eg. $x\left(2x+1\right)\left(x-3\right)\ \ \left(=0\right)$
We will condone on this occasion $x\left(x+\frac{1}{2}\right)(x-3)$

A1 Two of $x=0,-\frac{1}{2},3$ **following M1 awarded** .

A1 All of $x=0,-\frac{1}{2},3$ They do not have to be stated on one line together. Withhold if any additional solutions.

(b)

B1ft Sets $\left(y+3\right)^{\frac{1}{2}}=$ any of their solutions from (a) or this may be implied by later work on one of their solutions from (a). Note $(y+3)=0\Rightarrow y=-3$ is insufficient for the B mark but is acceptable for the final A mark (see below)

M1 Full method to find a value for y from a non-zero solution for x.
Scored for **squaring** and **subtracting 3**
Allow this to be scored for squaring and subtracting 3 from a negative value as well

A1ft $y=6$. Follow through on their positive solution from part (a)

A1 Both of $y = -3, 6$ with no incorrect working seen. If the solution $-\frac{11}{4}$ is found it must be discounted by the candidate (eg crossed out/rejected).

Beware that part (b) is hence so they must use their solutions from (a) and be careful regarding the -3 solution.

$(y+3)^{\frac{1}{2}} = 0 \Rightarrow y = -3$ and $(y+3) = 0 \Rightarrow y = -3$ is acceptable for the final A mark BUT

$(y+3)^{\frac{1}{2}} = 0 \Rightarrow y+3 = \sqrt{0} \Rightarrow y = -3$ is an incorrect method so A0

Give benefit of the doubt where it is unclear but send to review if unsure.

Question Number	Scheme	Marks
6.(a)	Attempts to find the gradient of $3x-4y+20=0 \Rightarrow y=\dfrac{3}{4}x+5$	M1
	Equation l_2 is $y-0="\dfrac{3}{4}"(x-8) \Rightarrow 3x-4y-24=0$ oe	M1, A1
		(3)
(b)	$P=\left(-\dfrac{20}{3},0\right), Q=(0,5)$	B1
	Area $PQRS=PR\times OQ=\left(8+"\dfrac{20}{3}"\right)\times"5"=\dfrac{220}{3}$	M1, A1
		(3)
(c)	$\overrightarrow{QR}=\begin{pmatrix}8\\-5\end{pmatrix} \Rightarrow S=\left(-\dfrac{20}{3}+8,0-5\right)=\left(\dfrac{4}{3},-5\right)$	M1, A1
		(2) **(8 marks)**
Alt(c)	Solve their $y="\dfrac{3}{4}x-6"$ with their $"y=-\dfrac{5}{8}\left(x+\dfrac{20}{3}\right)"$	
	$\dfrac{3}{4}x-6=-\dfrac{5}{8}\left(x+\dfrac{20}{3}\right) \Rightarrow \dfrac{11}{8}x=\dfrac{11}{6} \Rightarrow x=...$	M1
	$S=\left(\dfrac{4}{3},-5\right)$	A1
		(2)

If you see any unusual approaches which may involve vectors and matrices then please send to review if you are unsure how to mark.

(a)

M1 For an attempt to find the gradient of $3x-4y+20=0$
Look for an attempt to rearrange $3x-4y+20=0$ and make y the subject.
Expect to see $\pm 4y=...$ **followed by** $y=...$ **or equivalent** if they do not achieve the correct value.

M1 For using the same gradient as their gradient of l_1 with $R(8,0)$ to form a linear equation.
If they use $y=mx+c$ they must proceed as far as $c=...$ starting from a correct equation with their gradient of l_1 and the coordinates correctly substituted in.
Some candidates may set $3x-4y+c=0$ and substitute $(8,0)$ to find c which is M1M1.

A1 $3x-4y-24=0$ or any integer multiple. All terms must be on one side of an equation $=0$.
Correct equation implies full marks and it must be seen in (a) to score the A mark. (They may make errors in the manipulation of l_1 which is condoned).