Question	Scheme	Marks	AOs
10 (a)	Deduces that the gradient of line l_2 is $-\frac{5}{3}$	B1	1.1b
	Complete attempt to find the equation of line l_2 e.g., $y-0=-\frac{1}{"m_1"}(x-8)$	M1	1.1b
	$5x+3y=40$ *	A1*	2.1
		(3)	
(b)	Deduces $A(-10,0)$	B1	2.2a
	Attempts to solve $y=\frac{3}{5}x+6$ and $5x+3y=40$ simultaneously to find the y coordinate of their point of intersection	M1	1.1b
	y coordinate of C is $\frac{135}{17}$ o.e.	A1	1.1b
	Complete attempt at area $ABC=\frac{1}{2}\times\left(8+"10"\right)\times"\frac{135}{17}"$	dM1	2.1
	$=\frac{1215}{17}$	A1	1.1b
		(5)	
		(8 marks)	

Notes:

(a)

B1: Deduces that the gradient of line l_2 is $-\frac{5}{3}$ (accept $-\frac{5}{3}x$)

M1: Complete attempt to find the equation of line l_2 using $B(8,0)$ and a changed gradient.
If using $y = mx + c$ they must be using a changed gradient and proceed as far as $c = \ldots$

A1*: Clear work leading to the given answer of $5x+3y=40$ with no errors seen.
There is a requirement to "show that" so the must be at least one intermediate line between $y-0=-\frac{5}{3}(x-8)$ or finding c (e.g., $y=-\frac{5}{3}x+\frac{40}{3}$) and the answer.
Condone $3y+5x=40$

(a) Alternative

B1: Rearranges $5x+3y=40$ to $y=-\frac{5}{3}x+\ldots$

M1: Complete attempt to show that the equation of line l_2 is perpendicular to l_1 and that it passes through $B(8,0)$. Requires:

- **either** $-\frac{5}{3}$ is the negative reciprocal of $\frac{3}{5}$ **or** shows $-\frac{5}{3}\times\frac{3}{5}=-1$
- evidence that l_2 passes through $(8,0)$, e.g., $5(8)+3(0)=40$ **or** $y=-\frac{5}{3}(8)+\frac{40}{3}=0$

A1*: Clear work showing all elements of $5x+3y=40$ being perpendicular to l_1 and that $(8,0)$ lies on $5x+3y=40$, as above, with no errors seen and a minimal conclusion.

(b)

B1: Deduces $A(-10,0)$ May be awarded on the diagram as -10 or within a calculation.

M1: For the attempt to solve $y=\frac{3}{5}x+6$ (or e.g., $5y-3x=30$) and $5x+3y=40$ simultaneously to find the ***y* coordinate** of their point of intersection.
May be implied, i.e., from a calculator solution which must be correct to 1d.p.
They should be using the given equations but allow slips in rearranging.

A1: *y* coordinate of *C* is $\frac{135}{17}$ (Accept awrt 7.9 for this mark)

dM1: Scored for a complete and correct attempt to find the **exact** area of triangle *ABC*.
There may be numerical slips, e.g., in finding the *x* coordinates of *A*, but, e.g., the *x* and *y* coordinates should not be used the wrong way round.
Do not allow the use of decimals in place of exact values as they cannot meet the demand of the question.
See scheme using just the *y* coordinate of *C*.
Another option is to use Pythagoras' theorem to find *AC* and *BC* lengths using $A(-10,0)$, $B(8,0)$ and their $C\left(\frac{55}{17},\frac{135}{17}\right)$ Note: $AC=\frac{45\sqrt{34}}{17}$ and $BC=\frac{27\sqrt{34}}{17}$

A1: Proceeds correctly to area $ABC=\frac{1215}{17}$

(b) Alternative – you might see the following from Further Maths candidates:
B1M1A1 as above.

dM1: $$\frac{1}{2}\begin{vmatrix} 8 & "\frac{55}{17}" & "-10" & 8 \\ 0 & "\frac{135}{17}" & 0 & 0 \end{vmatrix}=\frac{1}{2}\left(8\times"\frac{135}{17}"-"-10"\times"\frac{135}{17}"\right)$$

or $$\frac{1}{2}\begin{vmatrix} 8 & 0 & 1 \\ "\frac{55}{17}" & "\frac{135}{17}" & 1 \\ "-10" & 0 & 1 \end{vmatrix}=\frac{1}{2}\left(8\times"\frac{135}{17}"-"-10"\times"\frac{135}{17}"\right)$$

A1: Proceeds correctly to area $ABC=\frac{1215}{17}$