① (a) Midpoint of AC $= \left(\frac{-3+11}{2}, \frac{8+0}{2}\right) = (4,4)$

$$m_{MB} = \frac{-6-4}{-1-4} = \frac{-10}{-5} = 2$$

$$y - 4 = 2(x-4)$$
$$= 2x - 8$$
$$y = 2x - 4$$

(b) $m_{BC} = \frac{0-(-6)}{11-(-1)} = \frac{6}{12} = \frac{1}{2}$

$$m_{\perp} = -2$$

$$y - 0 = -2(x-11)$$
$$y = -2x + 22$$

(c) Point of intersection: $2x - 4 = -2x + 22$

$$4x = 26$$
$$x = \frac{26}{4} = \frac{13}{2}$$

When $x = \frac{13}{2}$, $y = 2\left(\frac{13}{2}\right) - 4 = 13 - 4 = 9$

$\left(\frac{13}{2}, 9\right)$

Question			Generic scheme	Illustrative scheme	Max mark
1.	(a)		$\bullet^1$ determine midpoint of AC $\bullet^2$ determine gradient of median $\bullet^3$ find equation of median	$\bullet^1$ (4,4) $\bullet^2$ 2 or $\frac{10}{5}$ $\bullet^3$ $y=2x-4$	3

Notes:

1. $\bullet^2$ is only available to candidates who use a midpoint to find a gradient.
2. $\bullet^3$ is only available as a consequence of using a 'midpoint' of AC and the point B
3. At $\bullet^3$ accept any arrangement of a candidate's equation where the constant terms have been simplified.
4. $\bullet^3$ is not available as a consequence of using a perpendicular gradient.

Commonly Observed Responses:

Candidate A - perpendicular bisector of AC

Midpoint = (4,4) $\bullet^1$ ✓

$m_{AC}=-\frac{4}{7}\Rightarrow m_{\perp}=\frac{7}{4}$ $\bullet^2$ ×

$4y=7x-12$ $\bullet^3$ ✓$_2$

For other perpendicular bisectors award 0/3

Candidate B - altitude through B

$m_{AC}=-\frac{4}{7}$ $\bullet^1$ ^

$m_{\perp}=\frac{7}{4}$ $\bullet^2$ ×

$4y=7x-17$ $\bullet^3$ ✓$_2$

Candidate C - median through A

midpoint BC = $(5,-3)$ $\bullet^1$ ×

$m_{AM}=-\frac{11}{8}$ $\bullet^2$ ✓$_1$

$8y=-11x+31$ $\bullet^3$ ✓$_2$

Candidate D - median through C

midpoint AB $(-2,1)$ $\bullet^1$ ×

$m_{CM}=-\frac{1}{13}$ $\bullet^2$ ✓$_1$

$13y=-x+11$ $\bullet^3$ ✓$_2$

	(b)		$\bullet^4$ determine gradient of BC $\bullet^5$ determine gradient of L $\bullet^6$ find equation of L	$\bullet^4$ $\frac{6}{12}$ $\bullet^5$ $-\frac{12}{6}$ $\bullet^6$ $y=-2x+22$	3

Notes:

5. $\bullet^6$ is only available as a consequence of using a perpendicular gradient and C.
6. At $\bullet^6$ accept any arrangement of a candidate's equation where the constant terms have been simplified.

Commonly Observed Responses:

Candidate E - altitude through C

$m_{AB}=-7$ $\bullet^4$ ×

$m_{\perp}=\frac{1}{7}$ $\bullet^5$ ✓$_1$

$y=\frac{1}{7}(x-11)$ $\bullet^6$ ✓$_1$

Question			Generic scheme	Illustrative scheme	Max mark
1.	(c)		•7 determine x-coordinate •8 determine y-coordinate	•7 6.5 or $\frac{13}{2}$ •8 9	2
Notes:					
7. For $\left(\frac{26}{4}, 9\right)$ award 1/2.					
Commonly Observed Responses:					
Candidate F - rounding decimals (a) $4y = 5x - 19$ (b) $y = -2x + 22$ (c) $x = \frac{107}{13} = 8.2$ •7 ✓1 $y = 5.6$ •8 ✓1					