(7) $m = \tan 30^\circ$

$= \frac{1}{\sqrt{3}}$

$m_\perp = -\sqrt{3}$

$y + 4 = -\sqrt{3}(x - 0)$

$y + 4 = -\sqrt{3}x$

$y = -\sqrt{3}x - 4$

Question	Generic scheme	Illustrative scheme	Max mark
7.	**Method 1** •1 use $m = \tan\theta$ •2 find gradient of L •3 use property of perpendicular lines •4 determine equation of line	**Method 1** •1 $m = \tan 30°$ •2 $\frac{1}{\sqrt{3}}$ •3 $-\sqrt{3}$ •4 $y = -\sqrt{3}x - 4$	**4**
	Method 2 •1 find angle perpendicular line makes with the positive direction of the x-axis. •2 use $m = \tan\theta$ •3 find gradient of perpendicular line •4 determine equation of line	**Method 2** •1 $30° + 90° = 120°$ stated or implied by •2 •2 $m = \tan 120°$ •3 $-\sqrt{3}$ •4 $y = -\sqrt{3}x - 4$	

Notes:

1. In Method 1, where candidates make no reference to a trigonometric ratio or use an incorrect trigonometric ratio, •1 and •2 are unavailable.
   In Method 2, where candidates use an incorrect trigonometric ratio •2 and •3 are unavailable.
2. Accept $y + 4 = -\sqrt{3}(x)$ at •4, but do not accept $y + 4 = -\sqrt{3}(x - 0)$.
3. In Method 1, •4 is only available if the candidate has attempted to use a perpendicular gradient.

Commonly Observed Responses:

Candidate A

$m = \frac{1}{\sqrt{3}}$ (with or without diagram) •1 ^ •2 ✓ 2

$m_{\perp} = -\sqrt{3}$ •3 ✓ 1

Candidate B

$m = \tan\theta$ (with or without diagram) •1 ^

$m = \frac{1}{\sqrt{3}}$ •2 ✓ 1

Candidate C

$m = \tan\theta = 30$ •1 ✗

$m = \frac{1}{\sqrt{3}}$ •2 ✓ 1

Candidate D

$m = \tan^{-1} 30$ •1 ✗

$m = \frac{1}{\sqrt{3}}$ •2 ✓ 1

Candidate E

$\tan 30 = \frac{1}{\sqrt{3}}$ •1 ^

$m_{\perp} = -\sqrt{3}$ •2 ✓ 1 •3 ✓ 1