

- (a) $x = 2\sqrt{3}$ and $y = 2 \Rightarrow r = \sqrt{(2\sqrt{3})^2 + 2^2} = 4$ and
 $\theta = \tan^{-1}\left(\frac{2}{2\sqrt{3}}\right) = \tan^{-1}\left(\frac{1}{\sqrt{3}}\right) = \frac{\pi}{6}$. Since $(2\sqrt{3}, 2)$ is in the first quadrant, the polar coordinates are (i) $(4, \frac{\pi}{6})$ and (ii) $(-4, \frac{7\pi}{6})$.
- (b) $x = 1$ and $y = -5 \Rightarrow r = \sqrt{1^2 + (-5)^2} = \sqrt{26}$ and
 $\theta = \tan^{-1}\left(\frac{-5}{1}\right) = -\tan^{-1}(5)$. Since $(1, -5)$ is in the fourth quadrant, the polar coordinates are (i) $(\sqrt{26}, 2\pi - \tan^{-1}(5))$ and (ii) $(-\sqrt{26}, \pi - \tan^{-1}(5))$.