5.6

1) $|2+2\,i| = |2\,(1+i)| = |2|\,|1+i| = 2\sqrt{1^2+1^2} = 2\sqrt{2}$
$2+2\,i = 2\sqrt{2}\left(\frac{2}{2\sqrt{2}} + i\frac{2}{2\sqrt{2}}\right) = 2\sqrt{2}\left(\frac{1}{\sqrt{2}} + i\,\frac{1}{\sqrt{2}}\right) = 2\sqrt{2}\left(\frac{\sqrt{2}}{2} + i\,\frac{\sqrt{2}}{2}\right)$
$r = 2\sqrt{2} \qquad \varphi = \frac{\pi}{4}$

2) $|3\sqrt{3}+3\,i| = |3\,(\sqrt{3}+i)| = |3|\,|\sqrt{3}+i| = 3\sqrt{(\sqrt{3})^2+1^2} = 3\sqrt{4} = 3\cdot 2 = 6$
$3\sqrt{3}+3\,i = 6\left(\frac{3\sqrt{3}}{6} + i\,\frac{3}{6}\right) = 6\left(\frac{\sqrt{3}}{2} + i\,\frac{1}{2}\right)$
$r = 6 \qquad \varphi = \frac{\pi}{6}$

3) $|1-\sqrt{3}\,i| = \sqrt{1^2+(-\sqrt{3})^2} = \sqrt{1+3} = \sqrt{4} = 2$
$1-\sqrt{3}\,i = 2\left(\frac{1}{2} + i\,(-\frac{\sqrt{3}}{2})\right)$
$r = 2 \qquad \varphi = \frac{5\,\pi}{3}$

4) $|5\,i| = |5|\,|i| = 5\sqrt{0^2+1^2} = 5\sqrt{1} = 5$
$5\,i = 5\,(0+i\cdot 1)$
$r = 5 \qquad \varphi = \frac{\pi}{2}$

5) $|-3| = 3$
$-3 = 3\,(-1+i\cdot 0)$
$r = 3 \qquad \varphi = \pi$

6) $|-2\sqrt{3}-2\,i| = |-2\,(\sqrt{3}+i)| = |-2|\,|\sqrt{3}+i| = 2\sqrt{(\sqrt{3})^2+1^2} =$
$2\sqrt{3+1} = 2\sqrt{4} = 2\cdot 2 = 4$
$-2\sqrt{3}-2\,i = 4\left(-\frac{2\sqrt{3}}{4} + i\,(-\frac{2}{4})\right) = 4\left(-\frac{\sqrt{3}}{2} + i\,(-\frac{1}{2})\right)$
$r = 4 \qquad \varphi = \frac{7\,\pi}{6}$

7) $|-7-7\,i| = |-7\,(1+i)| = |-7|\,|1+i| = 7\sqrt{1^2+1^2} = 7\sqrt{2}$
$-7-7\,i = 7\sqrt{2}\left(-\frac{7}{7\sqrt{2}} + i\,(-\frac{7}{7\sqrt{2}})\right) = 7\sqrt{2}\left(-\frac{1}{\sqrt{2}} + i\,(-\frac{1}{\sqrt{2}})\right) =$
$7\sqrt{2}\left(-\frac{\sqrt{2}}{2} + i\,(-\frac{\sqrt{2}}{2})\right)$
$r = 7\sqrt{2} \qquad \varphi = \frac{5\,\pi}{4}$

8) $|-3\,i| = |-3|\,|i| = 3\sqrt{0^2+1^2} = 3\sqrt{1} = 3$
$-3\,i = 3\left(0+i\cdot(-1)\right)$
$r = 3 \qquad \varphi = \frac{3\,\pi}{2}$

9) $|\sin(\alpha)+i\,\cos(\alpha)| = \sqrt{\sin^2(\alpha)+\cos^2(\alpha)} = \sqrt{1} = 1$
$\sin(\alpha)+i\,\cos(\alpha) = \cos(\frac{\pi}{2}-\alpha)+i\,\sin(\frac{\pi}{2}-\alpha)$
$r = 1 \qquad \varphi = \frac{\pi}{2}-\alpha$