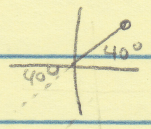
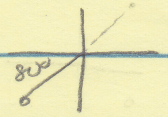
p400

1 $(2, 40^\circ)$; $(2, 40^\circ + 360^\circ) = (2, 400^\circ)$



$(-2, 40+180^\circ) = (-2, 220^\circ)$; $(-2, 220^\circ - 360^\circ) = (-2, -140^\circ)$

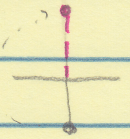
b $(3, -100^\circ) = (3, -100^\circ + 360^\circ) = (3, 260^\circ)$



$(-3, -100^\circ + 180^\circ) = (-3, 80^\circ)$; $(-3, 80^\circ - 360^\circ) = (-3, -280^\circ)$

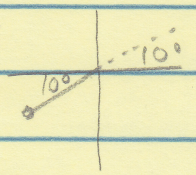
c $\left(5, \frac{3\pi}{2}\right) = \left(5, \frac{3\pi}{2} - \frac{2\pi}{1}\right) = \left(5, -\frac{\pi}{2}\right)$

$\left(-5, \frac{\pi}{2}\right) = \left(-5, \frac{\pi}{2} - \frac{2\pi}{1}\right) = \left(-5, -\frac{3\pi}{2}\right)$

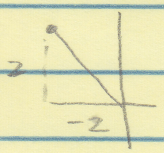


d. $(-4, 10^\circ) = (-4, 10^\circ - 360^\circ) = (-4, -350^\circ)$

$(4, 190^\circ) = (4, 190^\circ - 360^\circ) = (4, -170^\circ)$



3



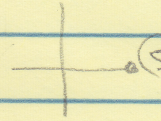
$r = \sqrt{(2)^2 + (-2)^2} = 2\sqrt{2}$

$\text{Ref}\angle = \tan^{-1}\left(\frac{2}{2}\right) = 45^\circ$

QII: $180^\circ - 45^\circ = 135^\circ$

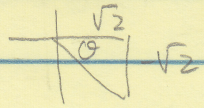
$\rightarrow (2\sqrt{2}, 135^\circ)$

b.



$r = 5$; $\theta = 0 \rightarrow (5, 0^\circ)$

c

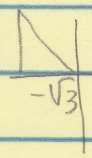


$r = \sqrt{(\sqrt{2})^2 + (-\sqrt{2})^2} = 2$

$\theta = 360^\circ - \tan^{-1}\left(\frac{\sqrt{2}}{\sqrt{2}}\right) = 315^\circ$

$\rightarrow (2, 315^\circ)$

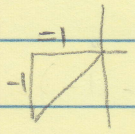
d



$r = \sqrt{(1)^2 + (-\sqrt{3})^2} = 2$

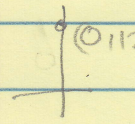
$\theta = 180^\circ - \tan^{-1}\left(\frac{1}{\sqrt{3}}\right) = 180^\circ - 30^\circ = 150^\circ$

$\rightarrow (2, 150^\circ)$

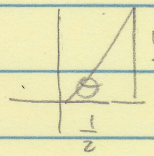
5 

$r = \sqrt{(-1)^2+(-1)^2} = \sqrt{2}$

$\theta = \pi + \tan^{-1}\left(\frac{1}{1}\right) = \pi + \frac{\pi}{4} = \frac{5\pi}{4}$ $\rightarrow \left(\sqrt{2}, \frac{5\pi}{4}\right)$

b 

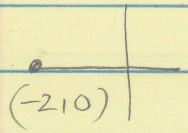
$r = 12 \; ; \theta = \frac{\pi}{2} \rightarrow \left(12, \frac{\pi}{2}\right)$

c 

$r = \sqrt{\left(\frac{1}{2}\right)^2+\left(\frac{\sqrt{3}}{2}\right)^2} = \sqrt{\frac{1}{4}+\frac{3}{4}} = 1$

$\theta = \tan^{-1}\left(\frac{\sqrt{3}}{2} \div \frac{1}{2}\right) = \tan^{-1}\left(\frac{\sqrt{3}}{2} \cdot \frac{2}{1}\right)$

$= \tan^{-1}(\sqrt{3}) = \frac{\pi}{3}$ $\rightarrow \left(1, \frac{\pi}{3}\right)$

d 

$r = 2$

$\theta = \pi$ $\rightarrow (2, \pi)$

7 $(4, 120°)$

$x = 4\cos 120° = 4\left(-\frac{1}{2}\right) = -2$

$y = 4\sin 120° = 4\left(\frac{\sqrt{3}}{2}\right) = 2\sqrt{3}$

$(-2, 2\sqrt{3})$

(b) $(-3, 90°)$

$(3, 270°)$

$x = 3\cos 270° = 3(0) = 0$

$y = 3\sin 270° = 3(-1) = -3$

$(0, -3)$

$(0,-1)$

c $\left(1, \frac{5\pi}{6}\right)$

$x = 1\cos\frac{5\pi}{6} = 1\left(-\frac{\sqrt{3}}{2}\right) = -\frac{\sqrt{3}}{2}$

$y = 1\sin\frac{5\pi}{6} = 1\left(\frac{1}{2}\right) = \frac{1}{2}$

$\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$

(d) $\left(2, \frac{3\pi}{4}\right)$

$x = 2\cos\frac{3\pi}{4} = 2\left(-\frac{\sqrt{2}}{2}\right) = -\sqrt{2}$

$y = 2\sin\frac{3\pi}{4} = 2\left(\frac{\sqrt{2}}{2}\right) = \sqrt{2}$

$(-\sqrt{2}, \sqrt{2})$

9 $(1, 20°)$

$x = 1\cos 20°$

$y = 1\sin 20°$

$(0.940, 0.342)$

(9b) $(2, 20°)$

$x = 2\cos 20°$

$y = 2\sin 20°$

$(1.879, 0.684)$

9c $(1, 2)$ θ in radian!

$x = 1\cos 2$

$y = 1\sin 2$

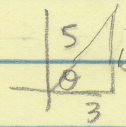
$(-0.416, 0.909)$

9d $(1, -2)$

$x = 1\cos(-2)$

$y = 1\sin(-2)$

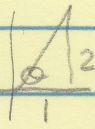
$(-0.416, -0.909)$

11 

$r = 5$

$\theta = \tan^{-1}\left(\frac{4}{3}\right) = 53.1°$

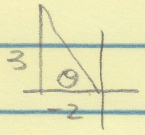
$(5, 53.1°)$

11b 

$r = \sqrt{4+1} = \sqrt{5}$

$\theta = \tan^{-1}\left(\frac{2}{1}\right) = 63.4$

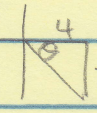
$(\sqrt{5}, 63.4°)$

11c 

$r = \sqrt{3^2+(-2)^2} = \sqrt{13} \approx 3.6$

$\theta = 180° - \tan^{-1}\left(\frac{3}{2}\right) = 123.7°$

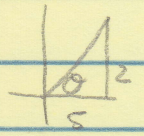
$(3.6, 123.7°)$

11d 

$r = \sqrt{16+36} = 2\sqrt{13} \approx 7.2$

$\theta = 360° - \tan^{-1}\left(\frac{6}{4}\right) \approx 303.7°$

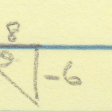
$(7.2, 303.7°)$

12 

$r = \sqrt{2^2+5^2} = \sqrt{29} \approx 5.4$

$\theta = \tan^{-1}\left(\frac{2}{5}\right) = 0.4$

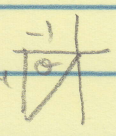
$(5.4, 0.4)$

12b 

$r = \sqrt{64+36} = 10$

$\theta = 2\pi - \tan^{-1}\left(\frac{6}{8}\right) \approx 5.6$

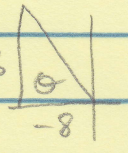
$(10, 5.6)$

12c 

$r = \sqrt{1+16} = \sqrt{17} \approx 4.1$

$\theta = \pi + \tan^{-1}\left(\frac{4}{1}\right) = 4.5$

$(4.1, 4.5)$

12d 

$r = \sqrt{36+64} = 10$

$\theta = \pi - \tan^{-1}\left(\frac{6}{8}\right) = 2.5$

$(10, 2.5)$