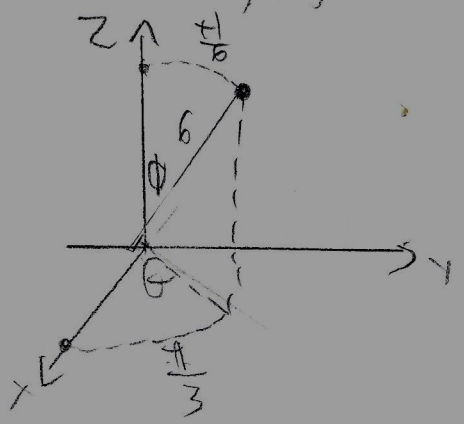
15.8 homework 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 25
29, 33, 37, 41

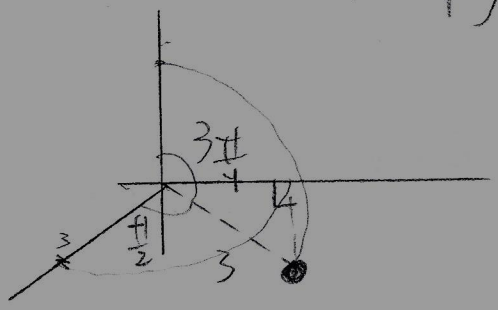
(1) a. $(6, \frac{\pi}{3}, \frac{\pi}{6})$



$\left(6\sin\left(\frac{\pi}{6}\right)\left(\cos\left(\frac{\pi}{3}\right)\right), 6\sin\left(\frac{\pi}{6}\right)\sin\left(\frac{\pi}{3}\right), 6\cos\left(\frac{\pi}{6}\right)\right)$

$= \boxed{\left(\frac{3}{2}, \frac{3\sqrt{3}}{2}, 3\sqrt{3}\right)}$

b. $(3, \frac{\pi}{2}, \frac{3\pi}{4})$



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

$= \boxed{\left(0, \frac{3\sqrt{2}}{2}, -\frac{3\sqrt{2}}{2}\right)}$

(3) a. $(0, -2, 0)$

$\rho^2 = 4$ $\quad 0 = \cos\phi$ $\quad -2 = 2\sin\theta$

$\rho = 2$ $\quad \phi = \frac{\pi}{2}$ $\quad \theta = \frac{3\pi}{2}$

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

b. $(-1, 1, -\sqrt{2})$

$\rho^2 = 4$ $\quad -\sqrt{2} = 2\cos\phi$

$\rho = 2$ $\quad \cos\phi = -\frac{\sqrt{2}}{2}$

$\phi = \frac{3\pi}{4}$

$-1 = 2\sin\left(\frac{3\pi}{4}\right)\cos\theta$

$-\frac{\sqrt{2}}{2} = \cos\theta$

$\theta = \frac{3\pi}{4}$

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