Section 8.1 Exercises:

I) Change the following polar coordinates to rectangular coordinates.

1) $(-2,-\frac{5\pi}{3})$, 2) $(-3,\frac{5\pi}{6})$, 3) $(2,-\frac{3\pi}{4})$, 4) $(-4,-\frac{3\pi}{2})$,

5) $(3,-3\pi)$, 6) $(-6,-120^{o})$

II) Change the following rectangular coordinates to polar coordinates.

1) $(-\sqrt{3},1)$, 2) $(0,-2)$, 3) $(-2,0)$, 3) $(-\sqrt{2},-\sqrt{2})$, 4) $(2,-2\sqrt{3})$

III) Change the following rectangular equations to polar equations.

1) $xy=-3$, 2) $y^2-x^2=10$, 3) $2x^2=5-2y^2$,

4) $3(x^2+y^2)=5x$, 5) $y^2=2x$, 6) $\sqrt{3}\,y=x$

7) $y=3x^2+x$, 8*) $x^2-y^2=x^4+2x^2y^2+y^4$

9*) $x^2-y^2=2xy$

IV) Change the following polar equations to rectangular equations.

1) $r=\frac{2}{2-\sin\theta}$, 2) $r^2=3\csc 2\theta$, 3) $\frac{r^2}{\sec 2\theta}=4$, 4) $r=2\cot\theta$

5) $\theta=-\frac{7\pi}{6}$, 6) $\frac{r}{2}=2\sin\theta-3\cos\theta$, 7) $r=\frac{3}{2\cos\theta+\sin\theta}$

8) $r=-2\sec\theta$, 9) $4r\csc\theta=5$, 10) $2r=-\sqrt{3}$,

11) $r=\sqrt{r\cos\theta-1}$, 12) $r^2=\frac{1}{1+\cos^2\theta}$, 13) $r^2=4\csc^2\theta$

V) Select all polar representations of the point with polar coordinates

$(r,\theta)=(-2,-\frac{7\pi}{6})$

a) $(r,\theta)=(-2,-\frac{5\pi}{6})$, b) $(r,\theta)=(2,-\frac{\pi}{6})$, c) $(r,\theta)=(2,-\frac{5\pi}{6})$

d) $(r,\theta)=(2,\frac{11\pi}{6})$, e) $(r,\theta)=(-2,\frac{5\pi}{6})$, f) $(r,\theta)=(2,-\frac{13\pi}{6})$