1) Change the following polar points to rectangular points:

    a) $(10 , \frac{4\pi}{3})$ b) $(8 , 330°)$

2) Change the following rectangular points to polar points:

    a) $(- 6 , 6)$ b) $(4 , - 3)$

3) Name the quadrant where each polar point resides:

    a) $(- 4 , - 60°)$ b) $(2 , - 240°)$

    c) $(- 3 , 225°)$ d) $(6 , 420°)$

4) Change each equation to a rectangular equation:

    a) $r = 5 \sin \theta$ b) $r = 10 \sec \theta$

5) Change each equation to a polar equation [solve for r]

    a) $4 y - 3 x = 11$ b) $x^2 + y^2 = 2 x + 4 y$

6) Write $10 (\cos \frac{5\pi}{3} + i \sin \frac{5\pi}{3})$ in complex form.

7) Write $10 \sqrt{2} - 10 \sqrt{2} \, i$ in polar form.

8) If $u = 8\,i - 15\,j$ and $v = -3\,i - 4\,j$ and $w = 12\,i + 6\,j$, then find:

a) $2\,w - 3\,u$

b) $\| 2\,u - 5\,v \|$

c) $v \cdot w$

d) the angle between u and v

e) the direction angle of vector w

f) $(3\,w + 7\,v) \cdot u$

g) find a vector in the same direction as u with a length of 12

h) find a vector orthogonal to vector v with a length of 7

i) find any vector that is ortogonal to the vector w

9) If vector $u = 8\,i - 14\,j$ and vector $v = -6\,i + k\,j$, then:

a) find k so that the vectors are orthogonal.

b) find k so that the vectors are parallel.

10) Complete the chart for hyperbolas:

equation	vertices	foci	asymptotes
$\dfrac{x^2}{25} - \dfrac{y^2}{144} = 1$	_____	_____	_____

equation	center	vertices	foci
$\dfrac{(y-2)^2}{16} - \dfrac{(x+1)^2}{9} = 1$	_____	_____	_____

11) Complete the chart for ellipses

equation	center	foci	major vertices
$\dfrac{x^2}{64} + \dfrac{y^2}{225} = 1$	_____	_____	_____
$\dfrac{(x-2)^2}{144} + \dfrac{(y+4)^2}{25} = 1$	_____	_____	_____

12) Complete the following chart for parabolas:

equation	vertex	focus	directrix
$y^2 = -24x$	_____	_____	_____
$(x-1)^2 = 12(y+7)$	_____	_____	_____

13) Find the equation of the ellipse centered about the origin with vertex at (0 , 7) and focus at (0 , 6).

14) Find the foci of the ellipse with equation $\dfrac{x^2}{625} + \dfrac{(y-5)^2}{49} = 1$

15) Find the focus and directrix of the parabola $(y-4)^2 = -24x$

16) Find the equation of the parabola with vertex at (2 , 7) and focus at (2 , 3).

17) Find the equation of the parabola with focus at (5 , - 2) and directrix at $x = -3$.

18) What is the center of the ellipse $9x^2 + 4y^2 - 36x + 40y + 100 = 0$?

19) What is the equation of the hyperbola centered about the origin with vertex at (14 , 0) and asymptote of $y = \dfrac{6}{7}x$?

20) Parabola or hyperbola or ellipse?

　　a) $x^2 + 6x - 2y^2 - 8y - 20 = 0$

　　b) $5x - y^2 - 4y - 20 = 0$

　　c) $4x^2 + 16x + 9y^2 - 18y = 11$

21) Find the vertex and the focus for the parabola with equation:

$$x^2 + 8x - 8y - 8 = 0$$