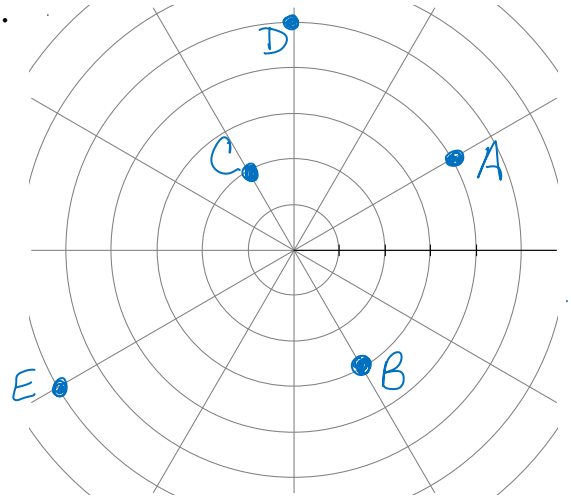
Review HW 6.4-6.5
Pre-Calculus

Name _____

Date _____ Period _____

No Calculator except where noted "Calc."

1) Plot the points on the polar grid. Label all points.



A) $(4, 30^\circ)$

B) $(3, -60^\circ)$

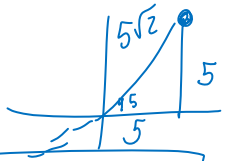
C) $(-2, \frac{5\pi}{3})$

D) $(-5, \frac{3\pi}{2})$

E) $(6, -\frac{5\pi}{6})$

For questions 2 – 4, change the following from rectangular to polar coordinates. Give two answers. One with a positive r value and one with a negative r value.

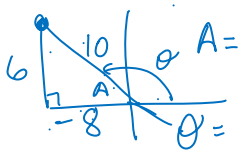
2) $(5,5)$



$(5\sqrt{2}, \frac{\pi}{4})$

$(-5\sqrt{2}, \frac{5\pi}{4})$

3) $(-8,6)$ (Calc)



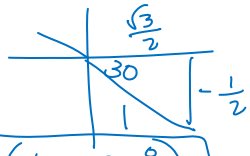
$A = \tan^{-1}\left(\frac{6}{8}\right) = 36.9^\circ$

$\theta = 180 - 36.9 = 143.1^\circ$

$(10, 143.1^\circ)$

$(-10, -36.9^\circ)$

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

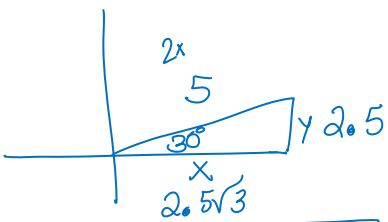


$(1, -30^\circ)$

$(-1, 150^\circ)$

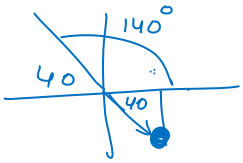
For questions 5 – 7, change the following from polar to rectangular coordinates.

5) $(5, \frac{\pi}{6})$



$(2.5\sqrt{3}, 2.5)$

6) $(-2, 140^\circ)$ (Calc)



$X = -2\cos 140^\circ$

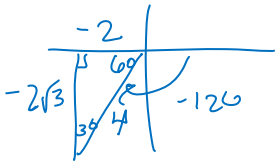
$X = 1.53$

$Y = -2\sin 140^\circ$

$Y = -1.29$

$(1.53, -1.29)$

7) $(4, -120^\circ)$



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

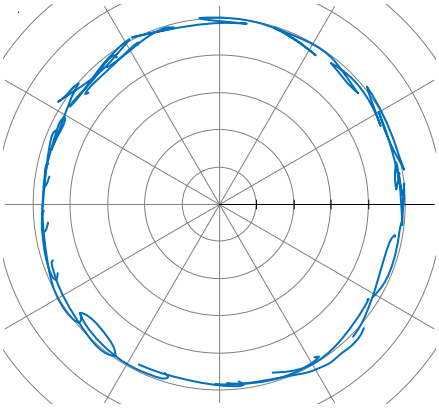
For questions 8 – 13, identify each of the following as a line, circle, cardioid, or limacon. Then, state the important parts such as axis of symmetry, x and y intercepts, diameter of circle, any other important information. Then graph each equation.

DO NOT USE A CALCULATOR!!

8) $r = 5$

Important Characteristics:

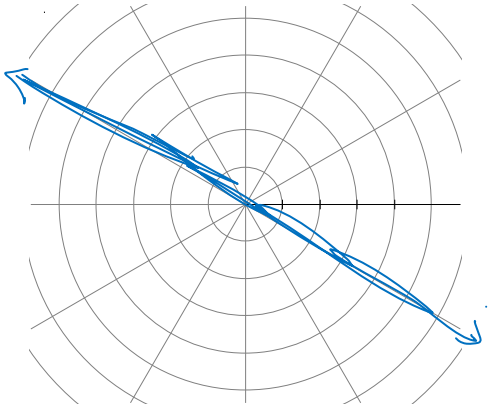
circle
center @ origin
radius = 5



9) $\theta = \frac{5\pi}{6}$

Important Characteristics

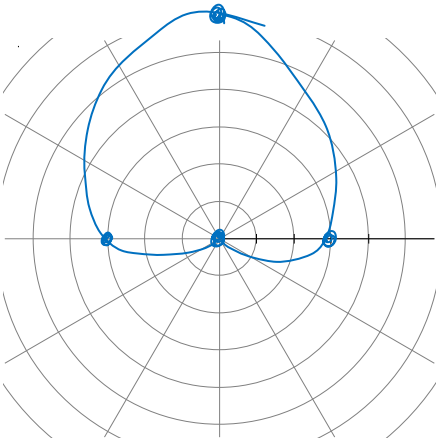
Line w/ angle of $\frac{5\pi}{6}$



10) $r(\theta) = 3 + 3\sin\theta$

Important Characteristics:

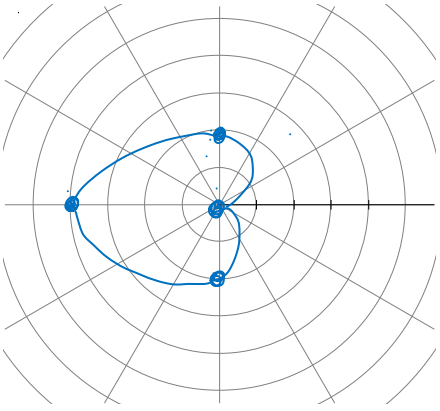
Cardioid on +y axis
x-int $\pm 3, 0$
y-int $0, 6$



11) $r(\theta) = 2 - 2\cos\theta$

Important Characteristics:

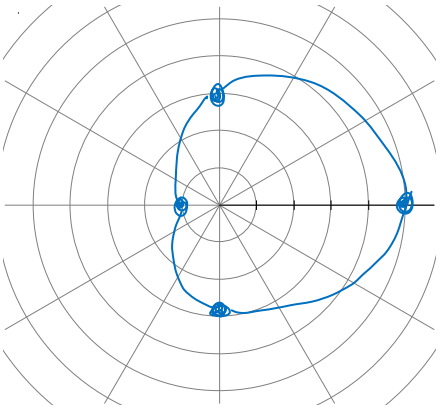
Cardioid on $-x$ axis
y-int $\pm 2, 0$
x-int $0, -4$



12) $r(\theta)=3+2\cos\theta$

Important Characteristics:

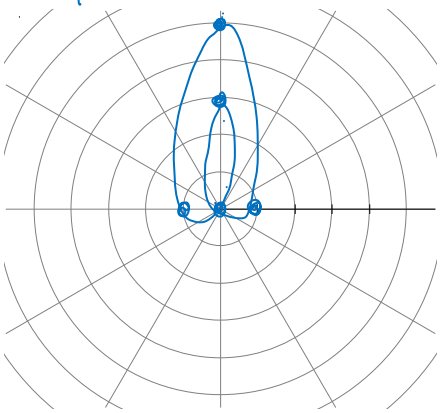
Limacon on + x axis
no inner loop
y-int ±3
x-int 5, −1



13) $r(\theta)=1+4\sin\theta$

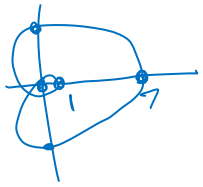
Important Characteristics:

Limacon on + y-axis
w/ inner loop
x-int ±1, 0
y-int 0, 5, 3



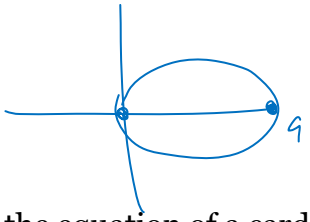
14) Write the equation of a limacon with y-intercepts of 3 and -3, and x-intercepts of 7, 0, and 1.

$a=3$ $\quad b+a=7$, $b=4$



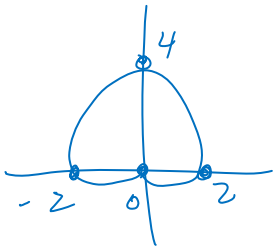
$r=3+4\cos\theta$

15) Write the equation of a circle that lays on the x-axis with x-intercepts of 0 and 9.



$r=9\cos\theta$

16) Write the equation of a cardioid with x-intercepts of +/- 2 and 0, and y-intercepts of 0 and 4.



$r=2+2\sin\theta$