TRIGONOMETRY MATH 1060 Name: _____

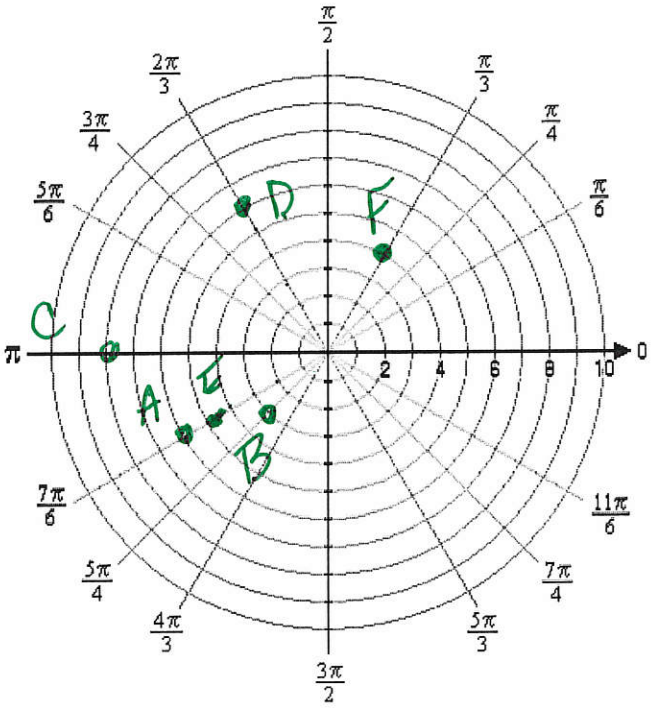
WORKSHEET 6.5/6.6

1. Plot the following:

A. $\left(6, \frac{7\pi}{6}\right)$ B. $\left(3, -\frac{3\pi}{4}\right)$

C. $(8, \pi)$ D. $\left(-6, \frac{5\pi}{3}\right)$

E. $\left(-5, -\frac{11\pi}{6}\right)$ F. $\left(-4, -\frac{2\pi}{3}\right)$



Transform the given coordinates to the given pair.

2. $\left(4, \frac{5\pi}{6}\right)$ *to* (x, y)

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

3. $\left(8, -\frac{\pi}{4}\right)$ *to* (x, y)

$8\left(\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$ $(4\sqrt{2}, -4\sqrt{2})$

4. $(3, -3)$ *to* (r, θ)

$\left(3\sqrt{2}, \frac{7\pi}{4}\right)$

5. $(-5, -5\sqrt{3})$ *to* (r, θ)

$\left(10, \frac{4\pi}{3}\right)$

6. $\left(-3, \frac{2\pi}{3}\right)$ *to* (x, y)

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

7. $\left(2, -\frac{\pi}{2}\right)$ *to* (x, y)

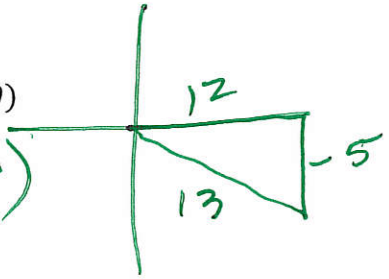
$2(0, -1) = (0, -2)$

8. $(4\sqrt{3}, 4)$ *to* (r, θ)

$(8, \pi/6)$

9. $(12, -5)$ *to* (r, θ)

$(13, -22.6°)$



Change the following polar equations to rectangular equations:

10. $r = 8$

$r^2 = 64$

$x^2 + y^2 = 64$

11. $r\cos\theta = 6$

$r = \frac{6}{\cos\theta}$

$x = 6$

12. $r = -5\csc\theta$

$r = -\frac{5}{\sin\theta}$

$r\sin\theta = -5$

$y = -5$

13. $r = 8\sin\theta$

$r^2 = 8r\sin\theta$

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

$x^2 + (y^2 - 8y + 16) = 0 + 16$

$x^2 + (y-4)^2 = 16$

Change the following rectangular equations to polar equations:

14. $x^2 + y^2 = 81$

$r^2 = 81$

$r = 9$

15. $y = -5$

$r\sin\theta = -5$

$r = \frac{-5}{\sin\theta}$

$r = -5\csc\theta$

16. $y^2 = 10x$

$r^2\sin^2\theta = 10r\cos\theta$

$r\sin^2\theta = 10\cos\theta$

$r = \frac{10\cos\theta}{\sin^2\theta}$

17. $3x - 4y = 8$

$3r\cos\theta - 4r\sin\theta = 8$

$r(3\cos\theta - 4\sin\theta) = 8$

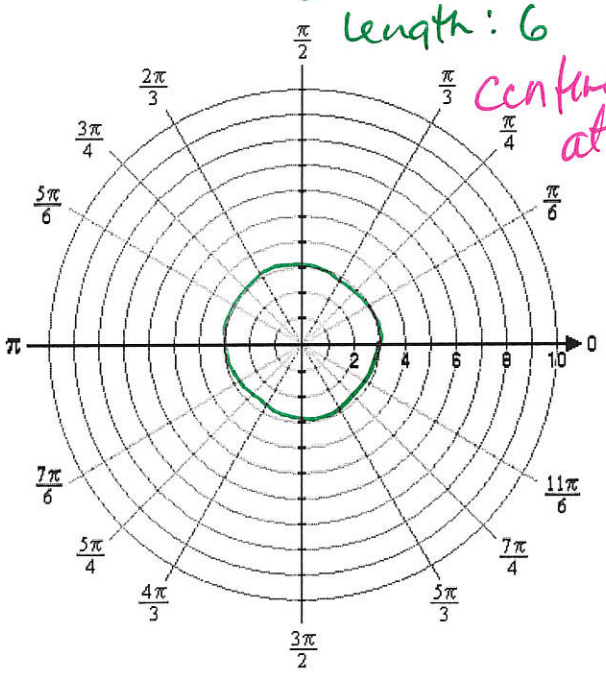
$r = \frac{8}{3\cos\theta - 4\sin\theta}$

Identify the polar graph; Then graph each polar equation.
If a circle, name the center (in polar coordinates) and the radius.
If a limacon, name the type and length
If a rose, state the number of petals, and the length of the petals.

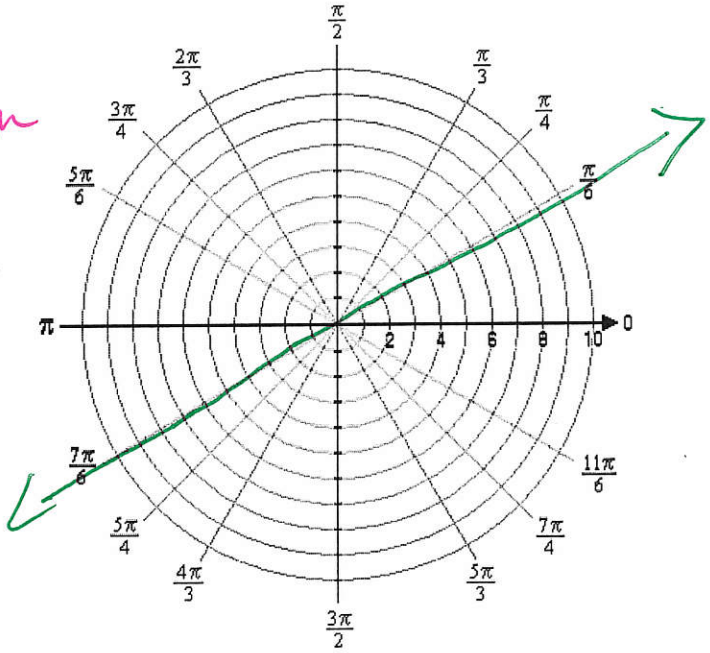
Line

18. $r = 3$

Type: Circle
length: 6
centered at origin

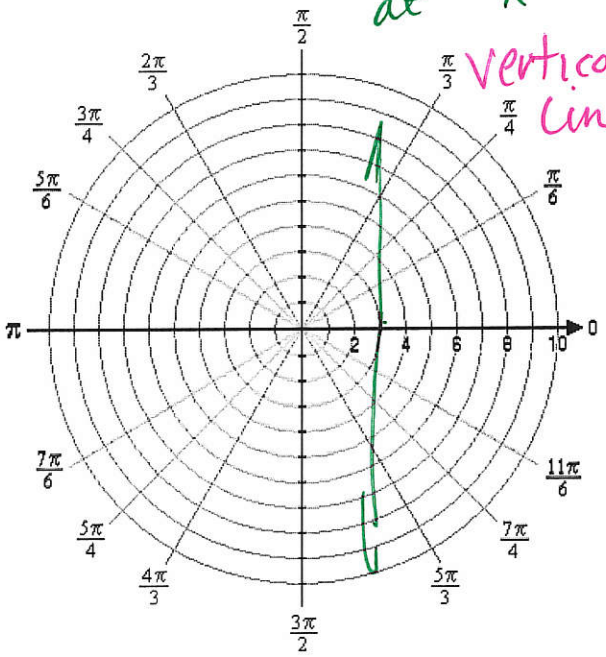


19. $\theta = \frac{7\pi}{6}$



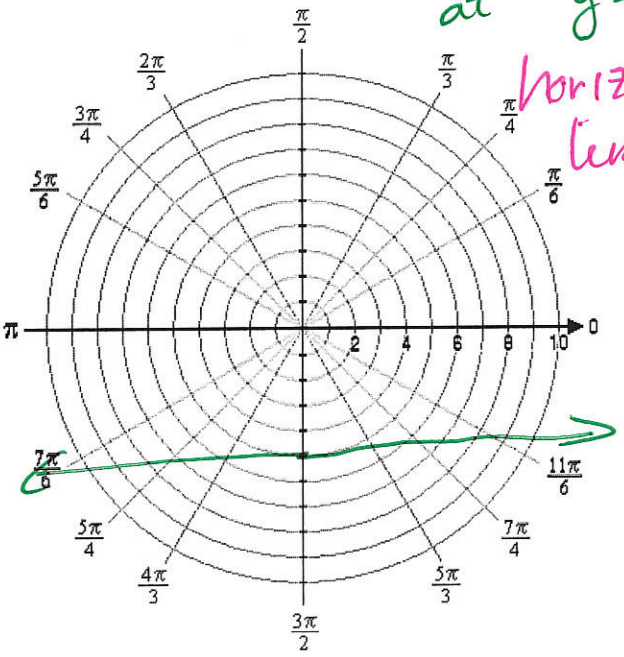
20. $r = 3\sec\theta$

line at $x = 3$
vertical line



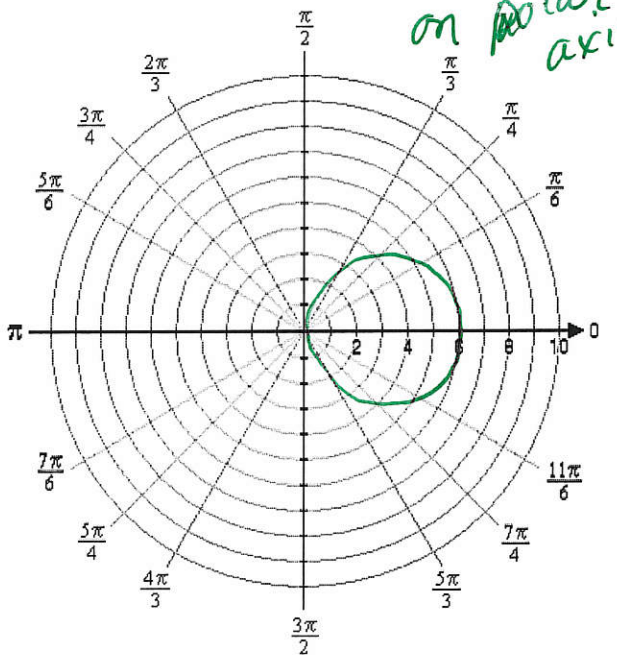
21. $r = -5\csc\theta$

line at $y = -5$
horizontal line



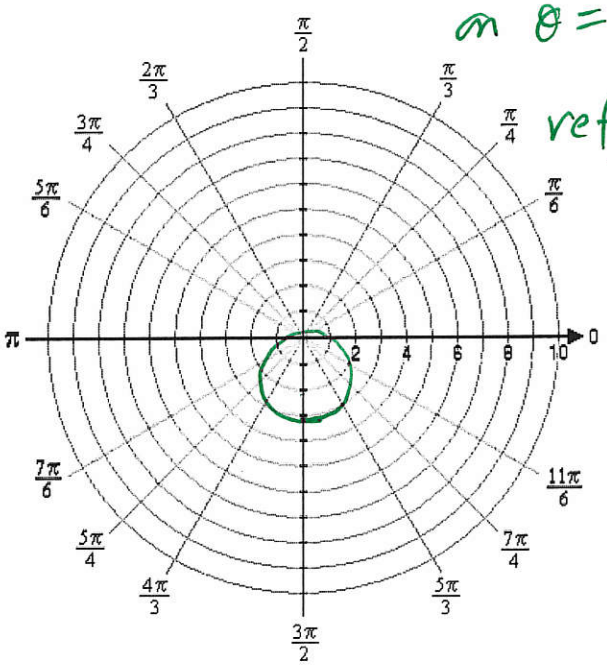
22. $r = 6\cos\theta$

Circle: length 6 on polar axis



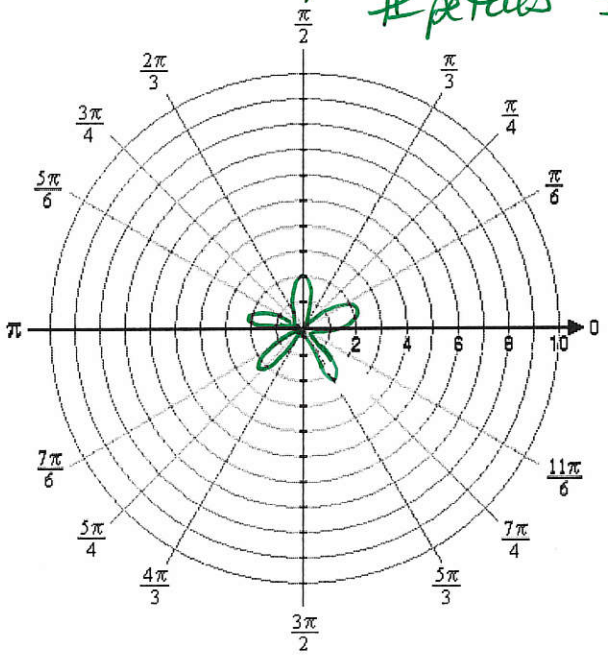
23. $r = -3\sin\theta$

Circle length 3 on $\theta = \frac{\pi}{2}$ reflected



24. $r = 2\sin 5\theta$

Rose petal length: 2 # petals 5



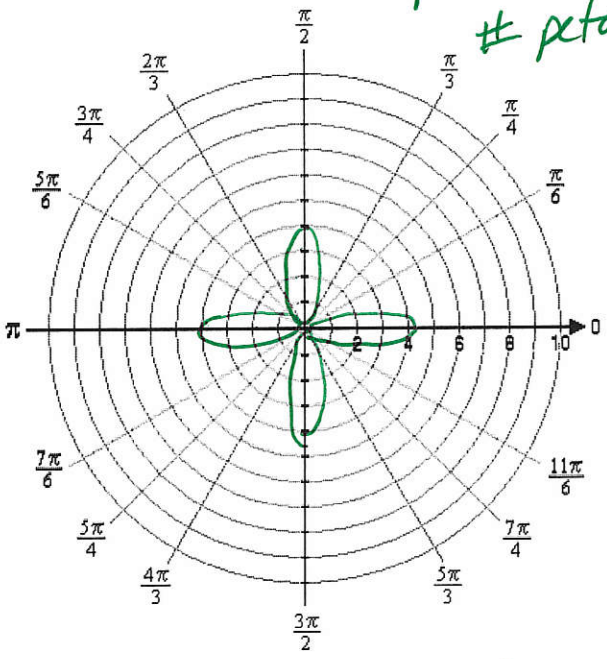
$5\theta = 90$

$\theta = 18° + 72°$

18, 90, 162, 234, 306°

25. $r = 4\cos 2\theta$

Rose petal length: 4 # petals 4

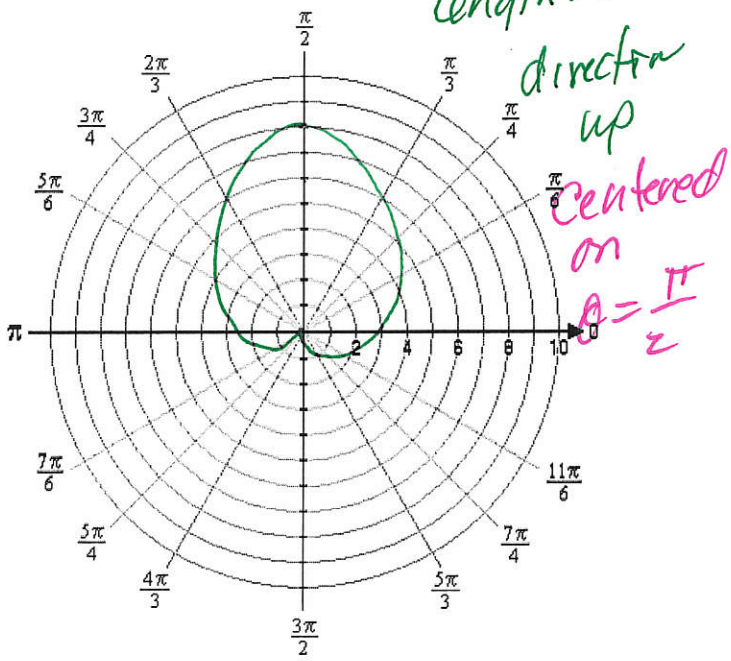


Start at 0°

90° apart

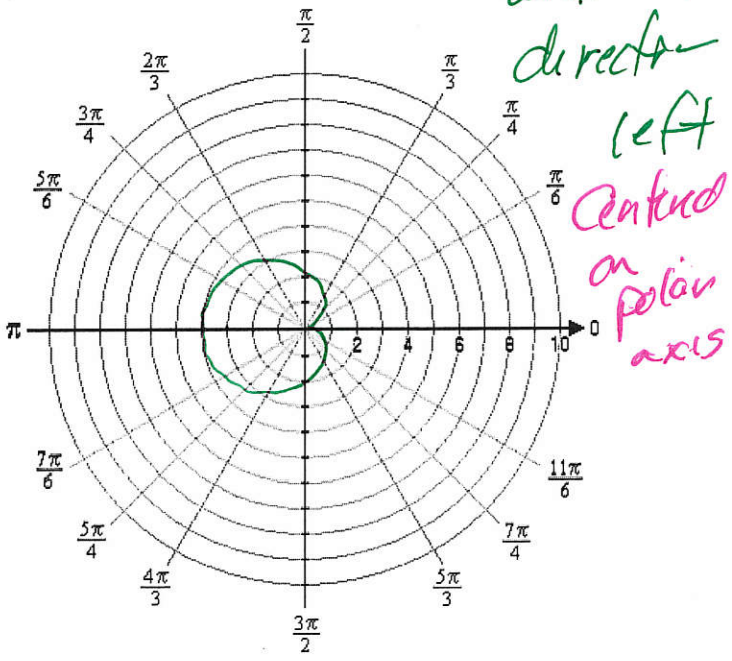
26. $r = 4 + 4\sin\theta$

Cardioid
length: 8
direction up
centered on $\theta = \frac{\pi}{2}$



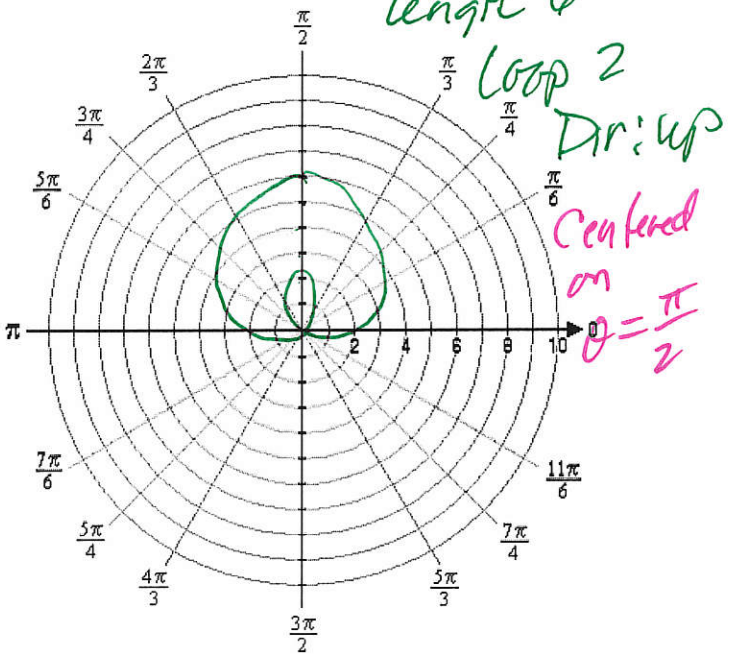
27. $r = 2 - 2\cos\theta$

Cardioid
length 4
direction left
centered on polar axis



28. $r = 2 + 4\sin\theta$

Limacon:
length 6
loop 2
Dir: up
Centered on $\theta = \frac{\pi}{2}$



29. $r = 3 - 6\cos\theta$

Limacon
length 9
loop 3
Dir. left
Centered on polar axis