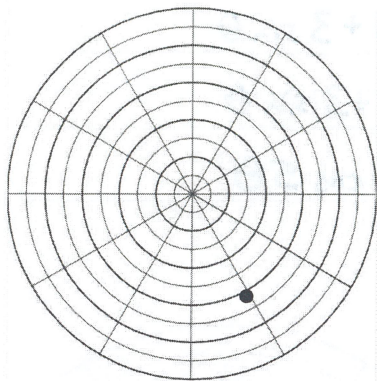


Ch. 9 Test REVIEW (Lessons 9.1-9.3)

Adv. Math

Name Key

1. Name ALL the possible polar coordinates of the point on the graph.



$[6, 300^\circ]$   $[-6, 120^\circ]$   
 $[6, -60^\circ]$   $[-6, -240^\circ]$

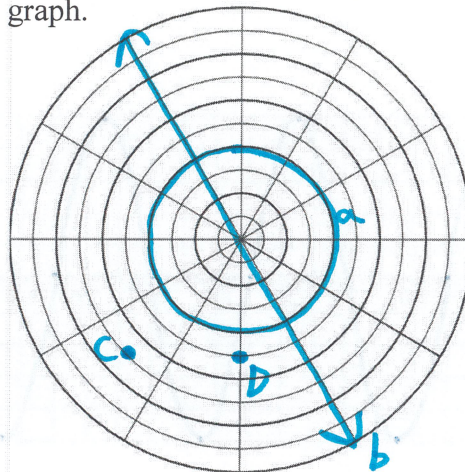
2. Graph the polar equations. Label each on the graph.

a.  $r = 4$

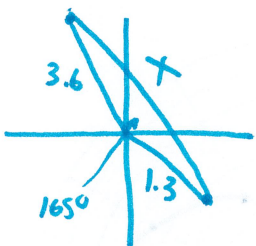
b.  $\theta = \frac{-\pi}{3}$

c.  $[7, 225^\circ]$

d.  $[-5, 90^\circ]$



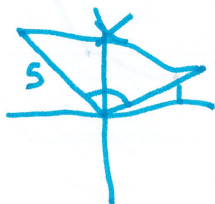
3. Find the distance between the two points:  $P_1[1.3, -47^\circ]$  and  $P_2[-3.6, -62^\circ]$



$$x^2 = 1.3^2 + 3.6^2 - 2(1.3)(3.6)\cos 165$$

$$x \approx 4.9$$

4. Find the distance between the two points:  $P_1[1, \frac{\pi}{6}]$  and  $P_2[5, \frac{3\pi}{4}]$  Use Radian Mode!



$$x^2 = 1^2 + 5^2 - 2(1)(5)\cos \frac{7\pi}{12}$$

$$x \approx 5.3$$

$$\frac{3\pi}{4} - \frac{\pi}{6}$$

$$\frac{9\pi}{12} - \frac{2\pi}{12} = \frac{7\pi}{12}$$

3. Write a polar equation for each:

Multiple  
Correct  
Answers

- a. rose curve with 12 petals, each of length 4
- b. limaçon with a loop
- c. limaçon with a dimple
- d. cardioid
- e. rose curve with 5 petals, each of length 3

$$r = 4 \sin 6\theta$$

$$r = 3 + 5 \cos \theta$$

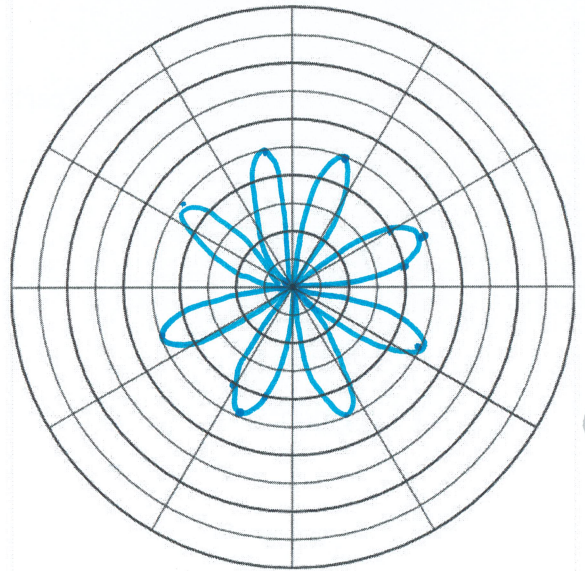
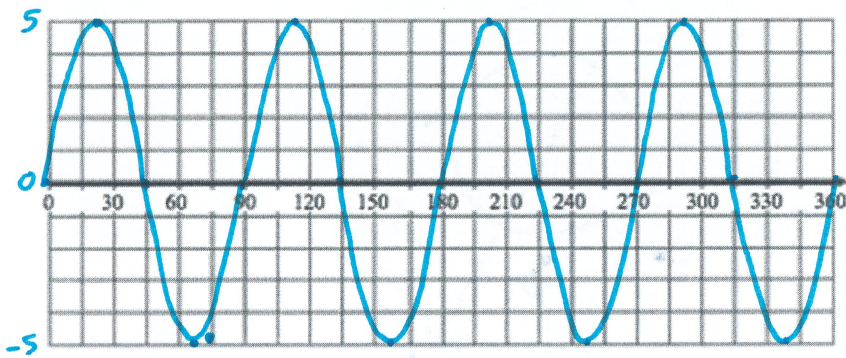
$$r = 5 + 3 \sin \theta$$

$$r = 3 + 3 \sin \theta$$

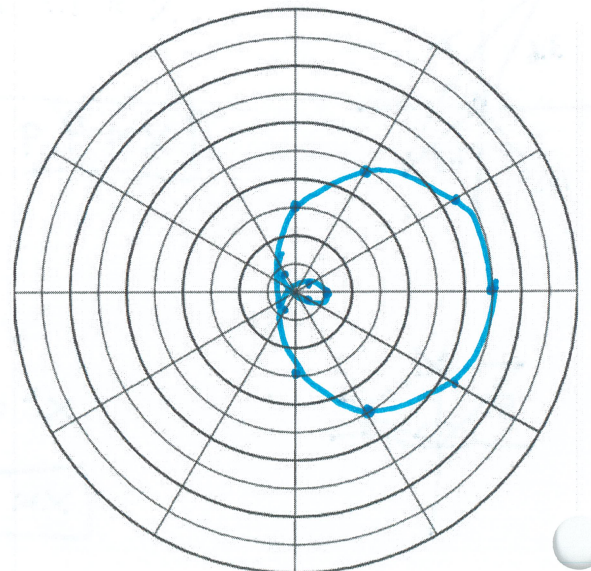
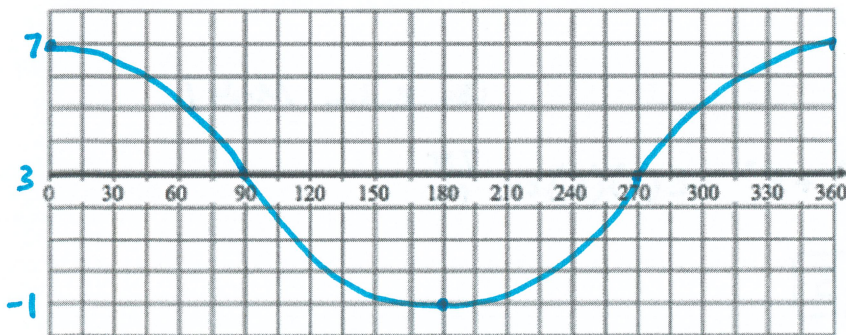
$$r = 3 \cos 5\theta$$

4. Graph both rectangular and polar graphs:  $r = 5 \sin 4\theta$

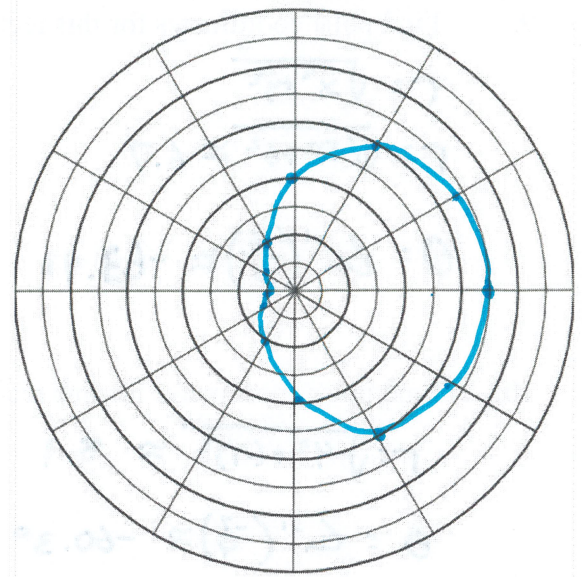
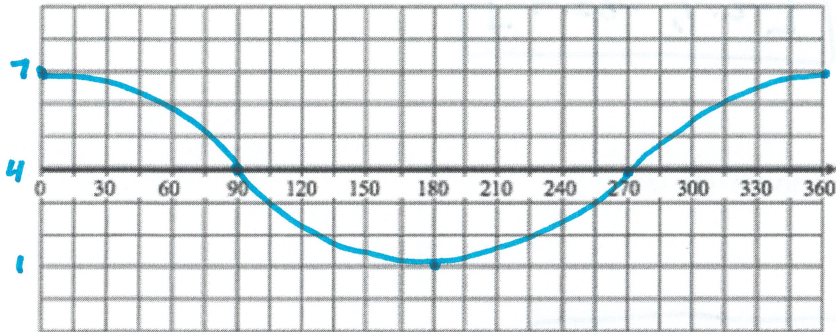
$$\frac{2\pi}{4} = \frac{\pi}{2} = 90^\circ$$



5. Graph both rectangular and polar graphs:  $r = 3 + 4 \cos \theta$

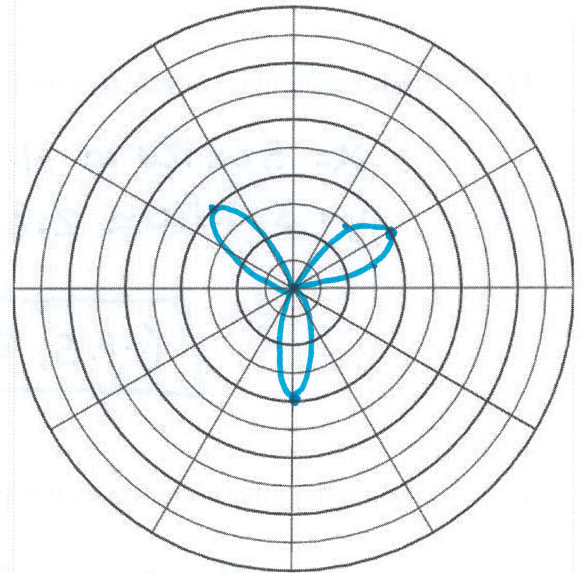
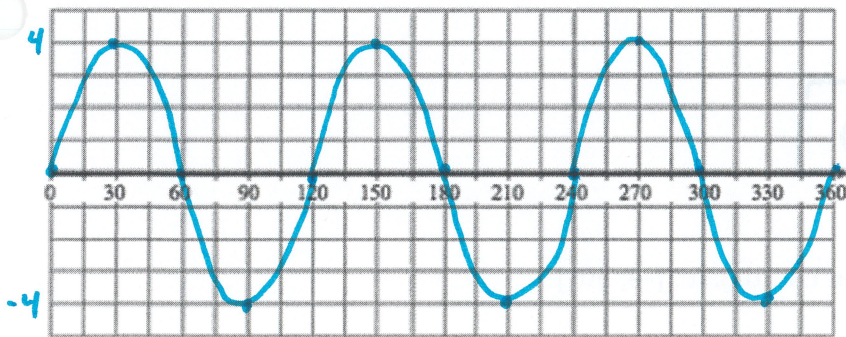


6. Graph both rectangular and polar graphs:  $r = 4 + 3 \cos \theta$



7. Graph both rectangular and polar graphs:  $r = 4 \sin 3\theta$

$\frac{2\pi}{3} = 120^\circ$



8. Match the equation to the **best** descriptor:

- B   1.  $r = 4 \cos 2\theta$
- F   2.  $r = 2 + 5 \sin \theta$
- D   3.  $r = 7$
- G   4.  $r = 3 + 3 \cos \theta$
- C   5.  $r = 4 \sin 3\theta$
- A   6.  $\theta = \frac{\pi}{2}$

- a. line
- b. rose curve, even petals
- c. rose curve, odd petals
- d. circle
- e. limaçon with dimple
- f. limaçon with loop
- g. cardioid

\* Put calculator into degree mode!

9. Find polar coordinates for this rectangular point:  $(-3, 6)$

$$r = \sqrt{x^2 + y^2}$$

$$r = \sqrt{(-3)^2 + 6^2} \approx 6.7$$

$$\theta = \tan^{-1}\left(\frac{6}{-3}\right) \approx -63.43$$

$$[-6.7, -63.4^\circ]$$

10. Find polar coordinates for this rectangular point:  $(4, -7)$

$$r = \sqrt{4^2 + (-7)^2} \approx 8.1$$

$$\theta = \tan^{-1}\left(\frac{-7}{4}\right) \approx -60.3^\circ$$

$$[8.1, -60.3^\circ]$$

11. Find rectangular coordinates for this polar coordinate:  $[3, 120^\circ]$

$$x = 3 \cos 120 \approx -1.5$$

$$y = 3 \sin 120 \approx 2.6$$

$$(-1.5, 2.6)$$

12. Find rectangular coordinates for this polar coordinate:  $[-4, 30^\circ]$

$$x = -4 \cos 30 \approx -3.5$$

$$y = -4 \sin 30 \approx -2$$

$$(-3.5, -2)$$