Example 1 – Match the polar equations with their graphs below.

E 1) $r = 3 - \cos\theta$

D 2) $r = 2 - 2\sin\theta$

F 3) $r = 5\cos(3\theta)$

B 4) $r = 2 - 2\cos\theta$

I 5) $r = 3 + 1.5\sin\theta$

C 6) $r = 3.5\cos(2\theta)$

G 7) $r = 5\sin(3\theta)$

J 8) $r^2 = -16\cos(2\theta)$

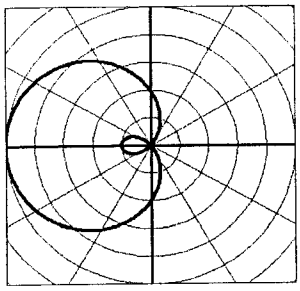
A 9) $r = 2 - 3\cos\theta$

H 10) $r = 3\cos(4\theta)$

L 11) $r = -4\cos\theta$

K 12) $r = 3.5\sin(2\theta)$

A.



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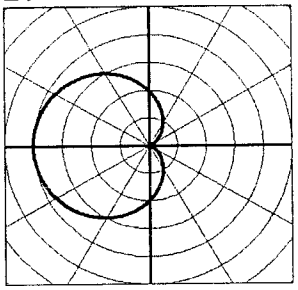

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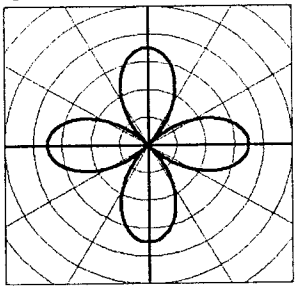

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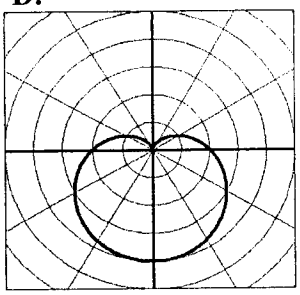

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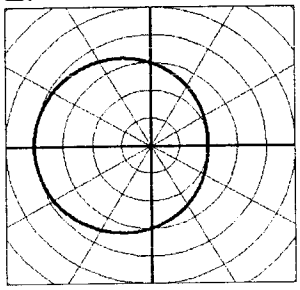

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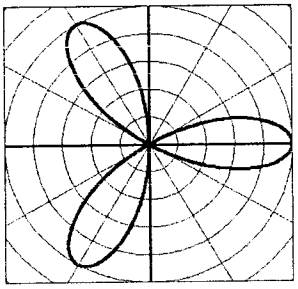

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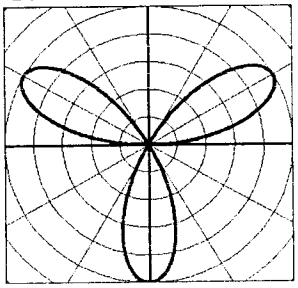

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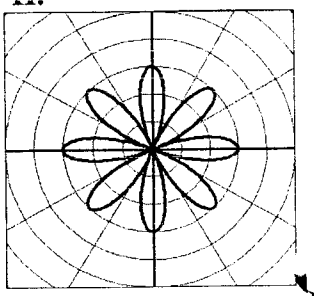

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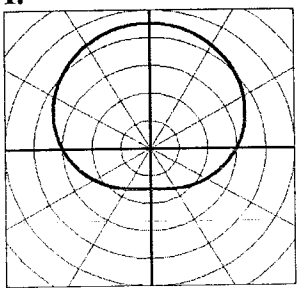

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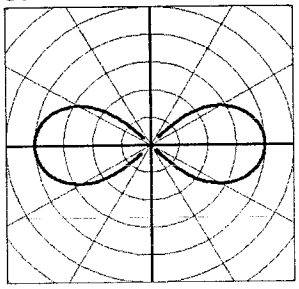

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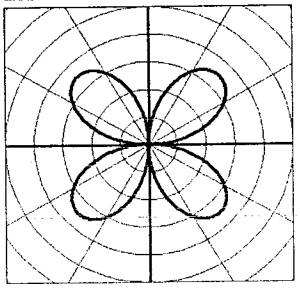

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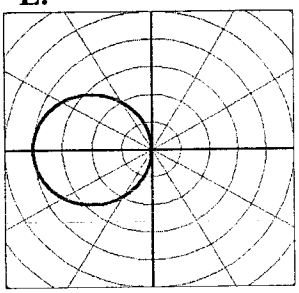


mple 2 – Match the polar equations with their graphs below.

K 1) $r = 2.5 + 2.5\sin\theta$

H 2) $r = 3$

M 3) $r = 3.5\sin(3\theta)$

P 4) $r = 4.5\sin(2\theta)$

L 5) $r = 4.5\cos(2\theta)$

A 6) $r = 1.5 + 2\cos\theta$

B 7) $r = -3\sin\theta$

N 8) $r = 2 - \sin\theta$

G 9) $r^2 = 16\sin(2\theta)$

O 10) $r = 4\cos(5\theta)$

E 11) $r = 3.5\cos(3\theta)$

F 12) $r = 2.5 - 2.5\cos\theta$

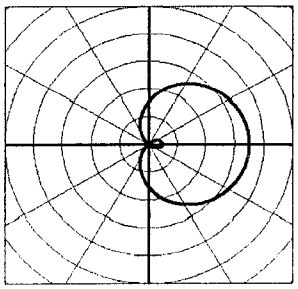
I 13) $r = 3\cos\theta$

J 14) $r = 1 + 4\sin\theta$

C 15) $r = 4.5\sin(6\theta)$

D 16) $r = \frac{1}{2}\theta$

A.



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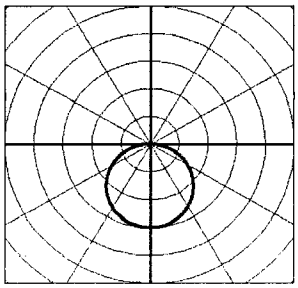

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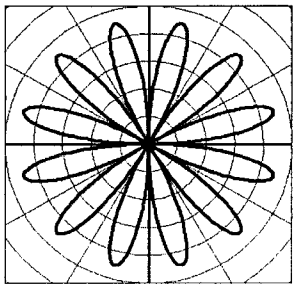

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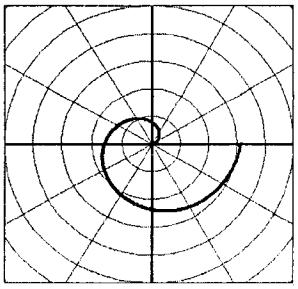

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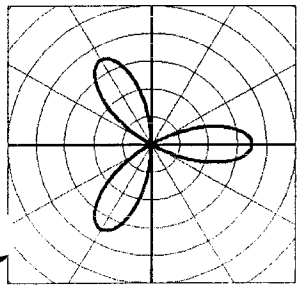

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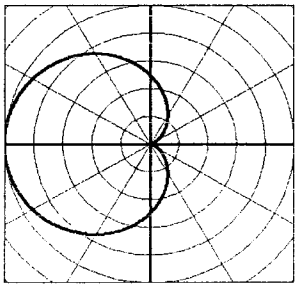

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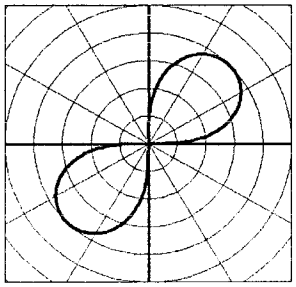

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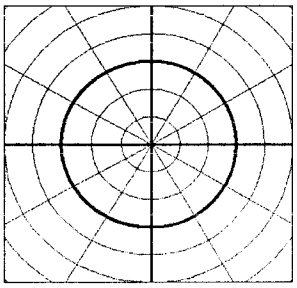

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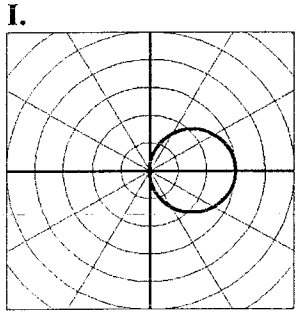

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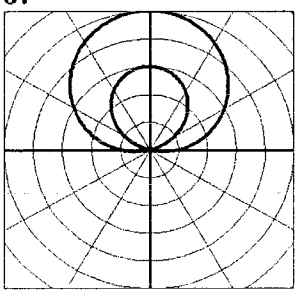

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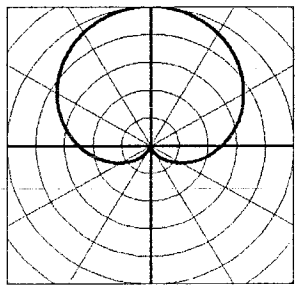

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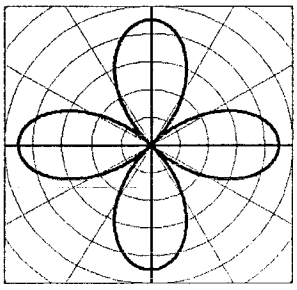

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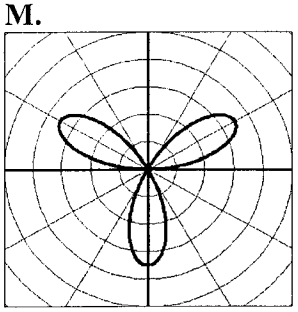

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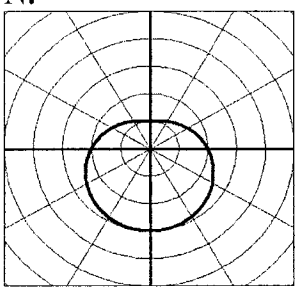

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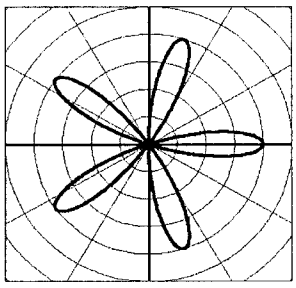

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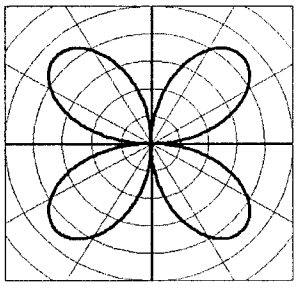
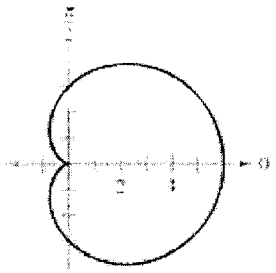


Practice 4.4: Polar Graphs

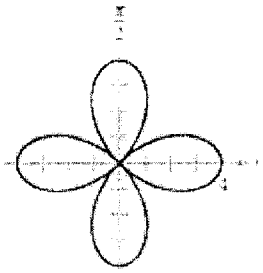
Match the graph with its polar equation.

1) $r = 2\sin\theta$ C 2) $r = 4\cos 2\theta$ B 3) $r = 3(1+\cos\theta)$ A 4) $r = 2\sec\theta$ D

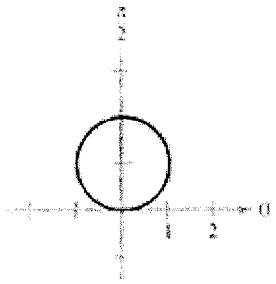
(a)



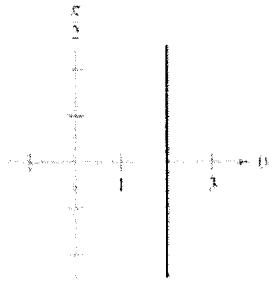
(b)



(c)



(d)



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5) **Identify the polar graph (circle, spiral, cardioid, limacon, rose):**
If the graph is a circle, name the center (in polar coordinates) and the radius.
If the graph is a limacon, name the type.
If the graph is a rose, state the number of petals.

1. $r = 4\cos\theta$
   circle $(2, 0)$ $r = 2$
2. $r = 5 - 2\sin\theta$
   limacon (convex)
3. $r = -7\sin 10\theta$
   rose (20 petals)
4. $r = 6\theta$
   spiral
5. $r = 4 + 7\sin\theta$
   limacon (w/ a loop)
6. $r = \frac{4}{\theta}$ spiral
7. $r = -2\sin\theta$
   circle $(1, 3\pi/2)$ $r = 1$
8. $r = 6 + 6\cos\theta$
   limacon (cardioid)
9. $r = 8\cos 5\theta$
   rose (5 petals)
10. $r = -8$
    circle $(8, 0)$ $r = 8$
11. $r = 8 + 6\cos\theta$
    limacon (dimpled)