HA2PC S.Hogan
Ch.10 (PC) Review

Your exam will be identical in format to this review. Only the actual numerical values in the questions will vary.

Part 1: Multiple-Choice—Choose the best answer of the choices provided. Write your answer clearly in the spaces provided below.
(40 questions—2 points each = 80 points)

Part 2: Free-Response— *(20 points total—10 points each)*
41. Write the equation for the ellipse in standard form. Identify the coordinates of the center, the vertices, and the foci. Sketch a graph of the ellipse.

$$16x^2 + 9y^2 - 32x + 72y + 16 = 0$$

Standard Form:
Center:
Vertices:
Foci:

42. Write the equation for the hyperbola in standard form. Identify the coordinates of the center, the vertices, and the foci. Write the equation for the asymptotes. Sketch the graph of the hyperbola.

$$-4x^2 + 25y^2 - 8x + 150y + 121 = 0$$

Standard Form:	
	Center:
	Vertices:
	Foci:
	Equation for Asymptote:

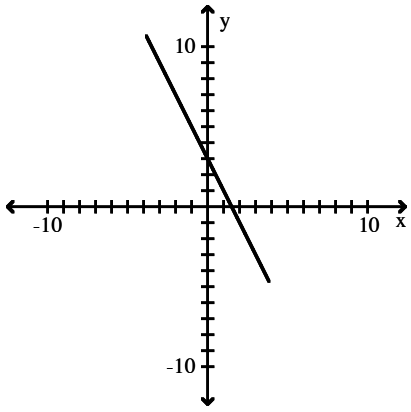
Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

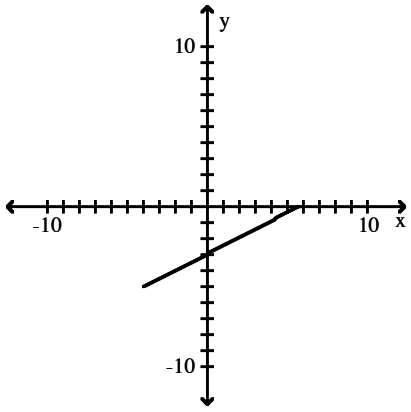
Graph the pair of parametric equations.

1) $x = 2t, y = t + 3, -2 \le t \le 3$ 1) _____

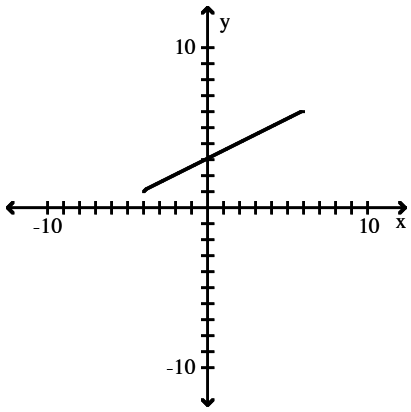
A)



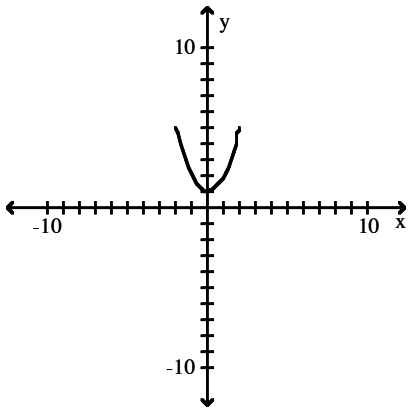
B)



C)



D)



Find the vertex, focus, directrix, and focal width of the parabola.

2) $x^2 = 4y$ 2) _____

A) Vertex: (0, 0); Focus: (0, –1); Directrix: x = –1; Focal width: 16

B) Vertex: (0, 0); Focus: (0, 1); Directrix: y = –1; Focal width: 4

C) Vertex: (0, 0); Focus: (1, 0); Directrix: y = 1; Focal width: 16

D) Vertex: (0, 0); Focus: (1, 0); Directrix: x = 1; Focal width: 1

3) $(y - 2)^2 = 4(x - 8)$ 3) _____

A) Vertex: (8, 2); Focus: (9, 2); Directrix: x = 7; Focal width: 4

B) Vertex: (2, 8); Focus: (2, 9); Directrix: y = 7; Focal width: 1

C) Vertex: (2, 8); Focus: (2, 12; Directrix: y = 4; Focal width: 4

D) Vertex: (8, 2); Focus: (12, 2); Directrix: x = 4; Focal width: 4

Find the vertex, the focus, and the directrix of the parabola.

4) $-3x^2 - 30x - y - 74 = 0$ 4) _____

A) Vertex: $\left(-5, -\frac{7}{2}\right)$; Focus: $(-5, -2)$; Directrix: $x = 4$

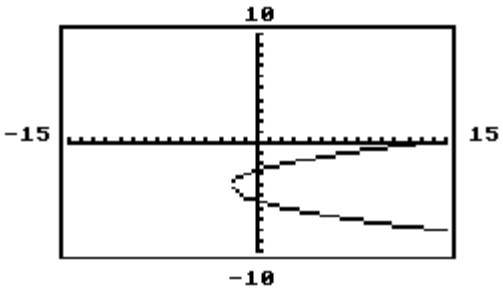
B) Vertex: $\left(-5, -\frac{12}{47}\right)$; Focus: $\left(-5, \frac{13}{12}\right)$; Directrix: $x = \frac{11}{12}$

C) Vertex: $(-5, -8)$; Focus: $(-5, -11)$; Directrix: $x = -13$

D) Vertex: $(-5, 1)$; Focus: $\left(-5, \frac{11}{12}\right)$; Directrix: $y = \frac{13}{12}$

Find an equation that matches the parabola's graph.

5) 5) _____



A) $y = (x + 4)^2 - 2$ B) $x = (y + 4)^2 - 2$

C) $y = (x - 4)^2 - 2$ D) $x = (y - 4)^2 + 2$

Find the standard form of the equation of the parabola.

6) Vertex at the origin, focus at $(0, -2)$ 6) _____

A) $y = -\frac{1}{2}x^2$ B) $y^2 = -8x$ C) $y^2 = -2x$ D) $y = -\frac{1}{8}x^2$

7) Focus at $(5, 4)$, directrix $x = -1$ 7) _____

A) $(y - 4)^2 = 12(x - 2)$ B) $(x - 4)^2 = 12(y - 2)$

C) $(y - 4)^2 = 12(x - 5)$ D) $(x - 5)^2 = 12(y - 4)$

Find the center, vertices, and foci of the ellipse with the given equation.

8) $\frac{x^2}{400} + \frac{y^2}{144} = 1$ 8) _____

A) Center: $(0, 0)$; Vertices: $(0, -20)$, $(0, 20)$; Foci: $(0, -16)$, $(0, 16)$

B) Center: $(0, 0)$; Vertices: $(-20, 0)$, $(20, 0)$; Foci: $(-12, 0)$, $(12, 0)$

C) Center: $(0, 0)$; Vertices: $(-20, 0)$, $(20, 0)$; Foci: $(-16, 0)$, $(16, 0)$

D) Center: $(0, 0)$; Vertices: $(0, -20)$, $(0, 20)$; Foci: $(0, -12)$, $(0, 12)$

9) $\frac{(x - 1)^2}{400} + \frac{(y - 5)^2}{256} = 1$ 9) _____

A) Center: $(1, 5)$; Vertices: $(-19, 5)$, $(21, 5)$; Foci: $(-15, 5)$, $(17, 5)$

B) Center: $(1, 5)$; Vertices: $(5, -19)$, $(5, 21)$; Foci: $(5, -11)$, $(5, 13)$

C) Center: $(1, 5)$; Vertices: $(-19, 5)$, $(21, 5)$; Foci: $(-11, 5)$, $(13, 5)$

D) Center: $(1, 5)$; Vertices: $(5, -19)$, $(5, 21)$; Foci: $(5, -15)$, $(5, 17)$

10) $7x^2 + 3y^2 = 21$ 10) _____

A) Center: (0, 0); Vertices: $(0, -\sqrt{7})$, $(0, \sqrt{7})$; Foci: $(0, -2)$, $(0, 2)$

B) Center: (0, 0); Vertices: $(0, -7)$, $(0, 7)$; Foci: $(0, -2\sqrt{10})$, $(0, 2\sqrt{10})$

C) Center: (0, 0); Vertices: $(-\sqrt{7}, 0)$, $(-\sqrt{7}, 0)$; Foci: $(-2, 0)$, $(2, 0)$

D) Center: (0, 0); Vertices: $(-7, 0)$, $(7, 0)$; Foci: $(-2\sqrt{10}, 0)$, $(2\sqrt{10}, 0)$

Find an equation in standard form for the ellipse that satisfies the given conditions.

11) Major axis endpoints (0, ±8), minor axis length 10 11) _____

A) $\frac{x^2}{8} + \frac{y^2}{5} = 1$ B) $\frac{x^2}{64} + \frac{y^2}{25} = 1$ C) $\frac{x^2}{5} + \frac{y^2}{8} = 1$ D) $\frac{y^2}{64} + \frac{x^2}{25} = 1$

12) Minor axis endpoints (±3, 0), major axis length 14 12) _____

A) $\frac{y^2}{49} + \frac{x^2}{9} = 1$ B) $\frac{x^2}{49} + \frac{y^2}{9} = 1$ C) $\frac{x^2}{3} + \frac{y^2}{7} = 1$ D) $\frac{x^2}{7} + \frac{y^2}{3} = 1$

13) An ellipse with foci at (–3, 7) and (–3, 1); major axis length of 10 13) _____

A) $\frac{(x-4)^2}{25} + \frac{(y-3)^2}{16} = 1$ B) $\frac{(y-4)^2}{25} + \frac{(x+3)^2}{16} = 1$

C) $\frac{(y-4)^2}{25} + \frac{(x-3)^2}{16} = 1$ D) $\frac{(x-4)^2}{16} + \frac{(y-3)^2}{25} = 1$

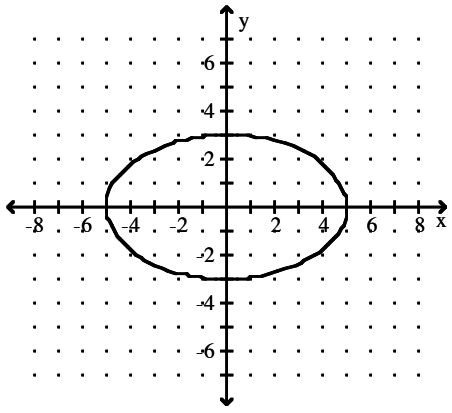
14) An ellipse with major axis from (–6, –4) to (4, –4); minor axis from (–1, –6) to (–1, –2) 14) _____

A) $\frac{(x-5)^2}{25} + \frac{(y-2)^2}{4} = 1$ B) $\frac{(x+1)^2}{25} + \frac{(y+4)^2}{4} = 1$

C) $\frac{(x+4)^2}{25} + \frac{(y+1)^2}{4} = 1$ D) $\frac{(x-1)^2}{25} + \frac{(y-4)^2}{4} = 1$

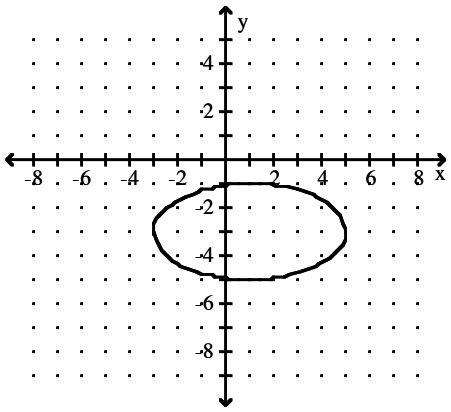
Match the given graph with its equation.

15) 15) _____



A) $\frac{x^2}{9} + \frac{y^2}{25} = 1$ B) $\frac{x^2}{5} + \frac{y^2}{3} = 1$ C) $\frac{x^2}{25} + \frac{y^2}{9} = 1$ D) $\frac{x^2}{10} + \frac{y^2}{6} = 1$

16) 16) _____



A) $\frac{(x+1)^2}{4} + \frac{(y-3)^2}{16} = 1$

B) $\frac{(x-1)^2}{16} + \frac{(y+3)^2}{4} = 1$

C) $\frac{(x-1)^2}{4} + \frac{(y+3)^2}{16} = 1$

D) $\frac{(x+1)^2}{16} + \frac{(y-3)^2}{4} = 1$

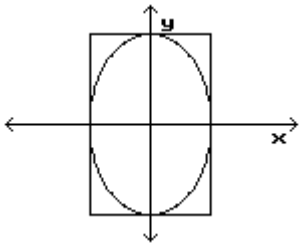
Find the eccentricity of the ellipse.

17) $x^2 + 3y^2 = 15$ 17) _____

A) $\frac{2\sqrt{3}}{15}$ B) $\frac{\sqrt{15}}{12}$ C) $\frac{\sqrt{15}}{10}$ D) $\frac{i\sqrt{2}}{3}$

Solve the problem.

18) An elliptical riding path is to be built on a rectangular piece of property that measures 10 mi by 8 mi. Find an equation for the ellipse if the path is to touch the center of the property line on all 4 sides 18) _____



A) $\frac{x^2}{16} + \frac{y^2}{25} = 1$ B) $\frac{x^2}{16} + \frac{y^2}{100} = 1$ C) $\frac{x^2}{100} + \frac{y^2}{16} = 1$ D) $\frac{x^2}{25} + \frac{y^2}{8} = 1$

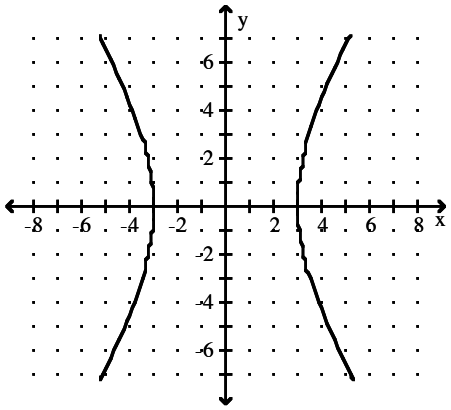
Find the vertices and foci of the hyperbola.

19) $\frac{(x-2)^2}{225} - \frac{(y-4)^2}{400} = 1$ 19) _____

A) Vertices: (4, 22), (4, −18); Foci: (4, −18), (4, 22)
B) Vertices: (17, 4), (−13, 4); Foci: (−23, 4), (27, 4)
C) Vertices: (4, 17), (4, −13); Foci: (4, −23), (4, 27)
D) Vertices: (22, 4), (−18, 4); Foci: (−18, 4), (22, 4)

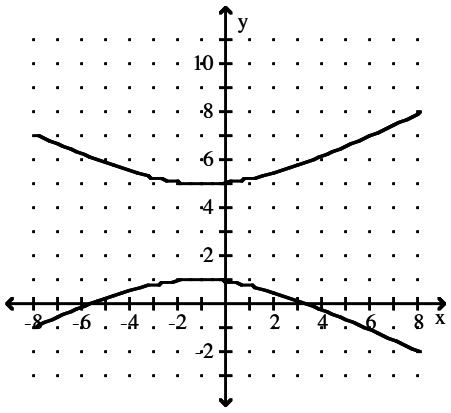
Match the given graph with its equation.

20) 20) _____



A) $\frac{x^2}{9} + \frac{y^2}{25} = 1$ B) $\frac{y^2}{9} - \frac{x^2}{25} = 1$ C) $\frac{x^2}{9} - \frac{y^2}{25} = 1$ D) $\frac{x^2}{25} - \frac{y^2}{9} = 1$

21) 21) _____

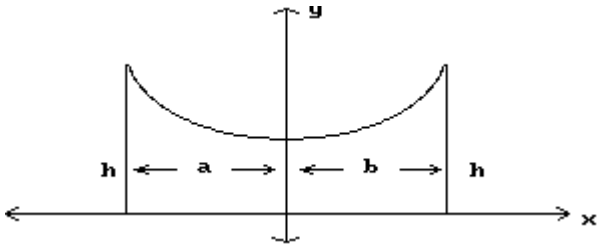


A) $\frac{(x-1)^2}{16} - \frac{(y-3)^2}{4} = 1$ B) $\frac{(y-3)^2}{16} - \frac{(x+1)^2}{4} = 1$

C) $\frac{(y-3)^2}{4} - \frac{(x+1)^2}{16} = 1$ D) $\frac{(x-3)^2}{16} - \frac{(x+1)^2}{4} = 1$

Solve the problem.

22) The roof of a building is in the shape of the hyperbola $2y^2 - x^2 = 75$, where x and y are in meters. Refer to the figure and determine the height, h, of the outside walls. 22) _____



a = b = 6 m

A) 7.4 m B) 111 m C) 10.5 m D) 55.5 m

Find an equation in standard form for the hyperbola that satisfies the given conditions.

23) Center (2, –4), focus (9, –4), vertex (5, –4) 23) _____

A) $\frac{(x-2)^2}{9} - \frac{(y+4)^2}{40} = 1$

B) $\frac{(x+2)^2}{9} - \frac{(y+4)^2}{40} = 1$

C) $\frac{(x-2)^2}{9} - \frac{(y+4)^2}{49} = 1$

D) $\frac{(x-2)^2}{40} - \frac{(y+4)^2}{9} = 1$

24) Vertices at (0, ±3), foci at (0, ±6) 24) _____

A) $\frac{y^2}{9} - \frac{x^2}{36} = 1$ B) $\frac{y^2}{27} - \frac{x^2}{9} = 1$ C) $\frac{y^2}{9} - \frac{x^2}{27} = 1$ D) $\frac{y^2}{36} - \frac{x^2}{9} = 1$

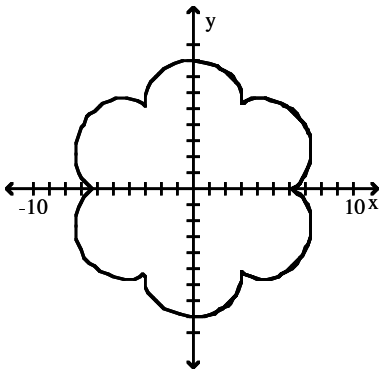
25) Vertices at (±2, 0), foci at (±6, 0) 25) _____

A) $\frac{x^2}{32} - \frac{y^2}{4} = 1$ B) $\frac{x^2}{4} - \frac{y^2}{36} = 1$ C) $\frac{x^2}{4} - \frac{y^2}{32} = 1$ D) $\frac{x^2}{36} - \frac{y^2}{4} = 1$

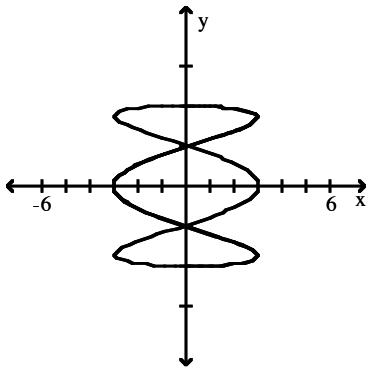
Find the graph of the given parametric equations.

26) $x = 10 \sin t + 4 \sin 6t$, $y = 10 \cos t - 4 \cos 6t$ 26) _____

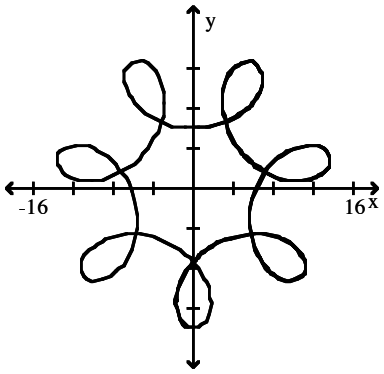
A)



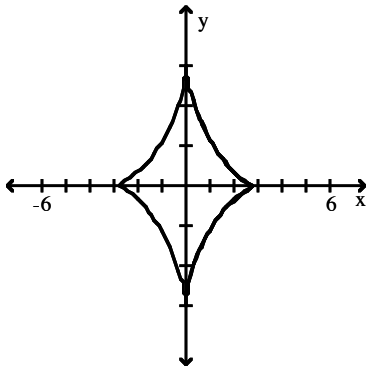
B)



C)



D)



Eliminate the parameter.

27) $x = 3t$, $y = t + 7$ 27) _____

A) $y = 3x - 7$ B) $y = x/3 + 7$ C) $y = x/3 - 7$ D) $y = 3x + 7$

28) $x = t - 3$, $y = t^2 + 5$ 28) _____

A) $y = x^2 + 6x + 14$ B) $y = x^2 - 6x - 14$

C) $y = x^2 + 14$ D) $y = x^2 - 14$

29) $x = 7 \cos t$, $y = 7 \sin t$ 29) _____

A) $(x + y)^2 = 49$ B) $x^2 + y^2 = 7$ C) $y = x \tan t$ D) $x^2 + y^2 = 49$

30) $x = t - 1$, $y = \frac{8}{t + 2}$ 30) _____

A) $y = \frac{8}{-x + 3}$ B) $y = \frac{8}{x + 1}$ C) $y = \frac{8}{x + 2}$ D) $y = \frac{8}{x + 3}$

Find the rectangular coordinates of the point with the given polar coordinates.

31) $\left(-2, \frac{1}{2}\pi\right)$ 31) _____

A) (0, 2) B) (0, –2) C) (–2, 0) D) (2, 0)

32) $(-4, -\pi/3)$ 32) _____

A) $(-2, -2\sqrt{3})$ B) $(2, 2\sqrt{3})$ C) $(2, -2\sqrt{3})$ D) $(-2, 2\sqrt{3})$

33) $(-4, \pi)$ 33) _____

A) (4, 0) B) (0, –4) C) (0, 4) D) (–4, 0)

34) (6, 0°) 34) _____

A) (–6, 0) B) (0, –6) C) (6, 0) D) (0, 6)

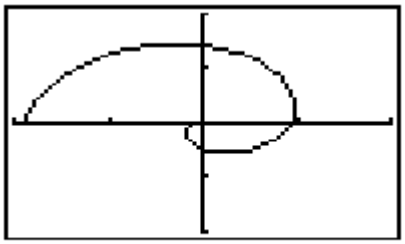
35) (4, 120°) 35) _____

A) $(-2\sqrt{3}, 2)$ B) $(2, -2\sqrt{3})$ C) $(-2, 2\sqrt{3})$ D) $(2\sqrt{3}, -2)$

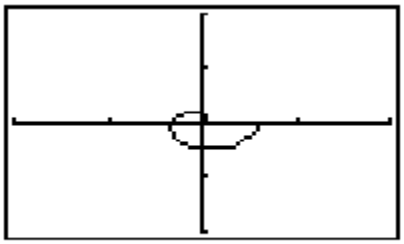
With your calculator set to radian mode and polar graphics capability, graph the following function in the window specified.

36) $r = 3\theta$, $0 \le \theta \le 2\pi$, [−20, 20] by [−20, 20] 36) _____

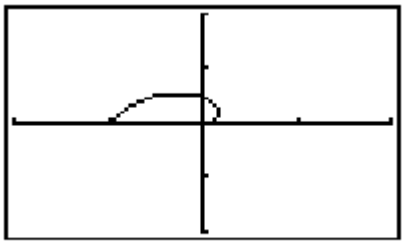
A)



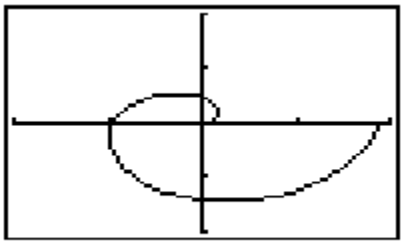
B)



C)

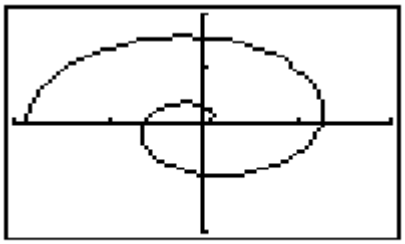


D)

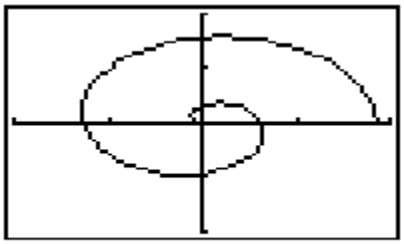


37) $r = 2\theta$, $-3\pi \le \theta \le 3\pi$, [−20, 20] by [−20, 20] 37) _____

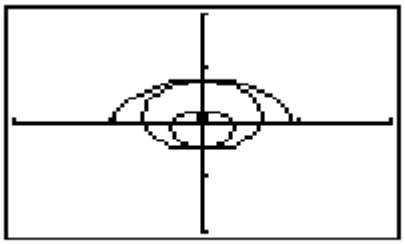
A)



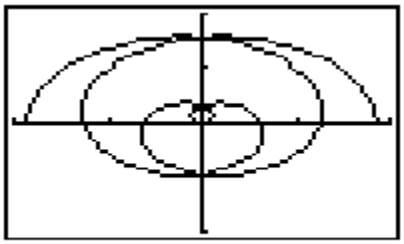
B)



C)

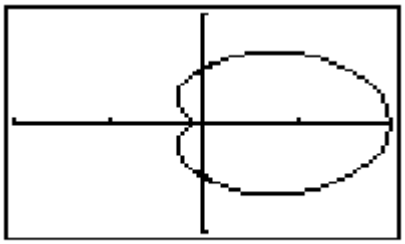


D)

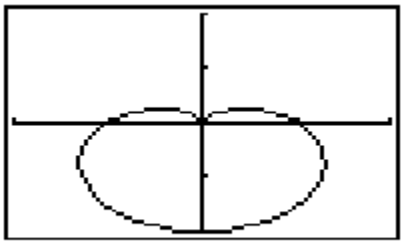


38) $r = 2 - 2 \sin \theta$, $-2\pi \le \theta \le 2\pi$, $[-4, 4]$ by $[-4, 4]$ 38) _____

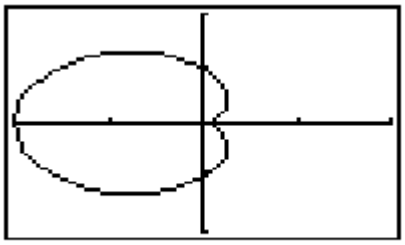
A)



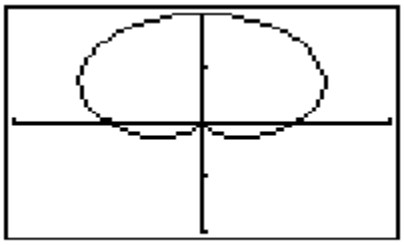
B)



C)

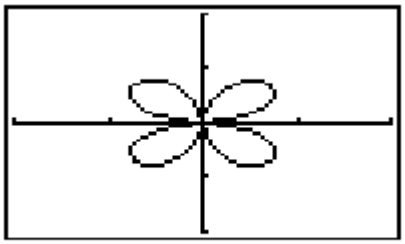


D)

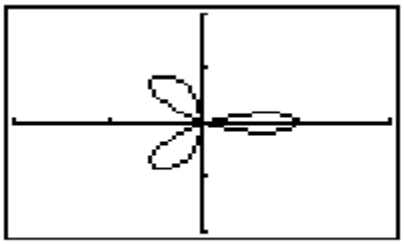


39) $r = \cos 3\theta - \sin 2\theta$, $0 \le \theta \le 6\pi$, $[-2, 2]$ by $[-2, 2]$ 39) _____

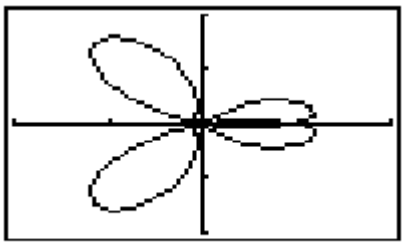
A)



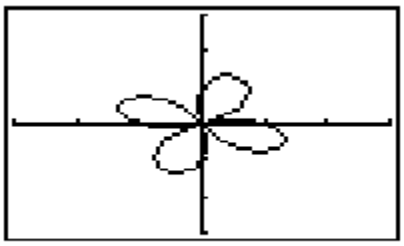
B)



C)



D)



Solve the problem.

40) The locations, given in polar coordinates, of two ships are (8 mi, 13°) and (6 mi, 73°). Find the distance between the two ships. 40) _____

A) ≈ 3604.00 mi

B) ≈ 10.00 mi

C) $\sqrt{52}$ ≈ 7.21 mi

D) ≈ 4.11 mi

Answer Key
Testname: HA2PC_CH10(PC)_REVIEW

1) C
2) B
3) A
4) D
5) B
6) D
7) A
8) C
9) C
10) A
11) D
12) A
13) B
14) B
15) C
16) B
17) D
18) A
19) B
20) C
21) C
22) A
23) A
24) C
25) C
26) C
27) B
28) A
29) D
30) D
31) B
32) D
33) A
34) C
35) C
36) D
37) D
38) B
39) C
40) C