Algebra 2 - Mr.C. - All work on looseleaf. Name_____

Practice for Q3Exam2

Date_____ Period____

Use the information provided to write the standard form equation of each ellipse.

1) Center: $(7, 4)$
Vertex: $(18, 4)$
Focus: $(7 - 4\sqrt{6}, 4)$

2) Center: $(-6, -2)$
Vertex: $(-20, -2)$
Focus: $(-6 + \sqrt{115}, -2)$

3) Center: $(-5, 10)$
Vertex: $(-14, 10)$
Focus: $(-5 - \sqrt{17}, 10)$

4) Center: $(7, 8)$
Vertex: $(7, 20)$
Focus: $(7, 8 + 3\sqrt{15})$

5) Center: $(-2, 2)$
Vertex: $(11, 2)$
Focus: $(-2 + \sqrt{165}, 2)$

6) Center: $(-4, 3)$
Vertex: $(-4 - \sqrt{30}, 3)$
Focus: $(-4 - \sqrt{10}, 3)$

7) Center: $(7, 4)$
Vertex: $(7 - \sqrt{105}, 4)$
Focus: $(7 + \sqrt{55}, 4)$

8) Center: $(5, 3)$
Vertex: $(5 + 5\sqrt{3}, 3)$
Focus: $(5 + 3\sqrt{5}, 3)$

9) Vertices: $(-1, 14)$, $(-1, -10)$
Co-vertices: $(6, 2)$, $(-8, 2)$

10) Vertices: $(-7, 5)$, $(-7, -15)$
Co-vertices: $(-2, -5)$, $(-12, -5)$

11) Vertices: $(-4, 3)$, $(-4, -9)$
Co-vertices: $(0, -3)$, $(-8, -3)$

12) Vertices: $(2, 9)$, $(2, -11)$
Co-vertices: $(6, -1)$, $(-2, -1)$

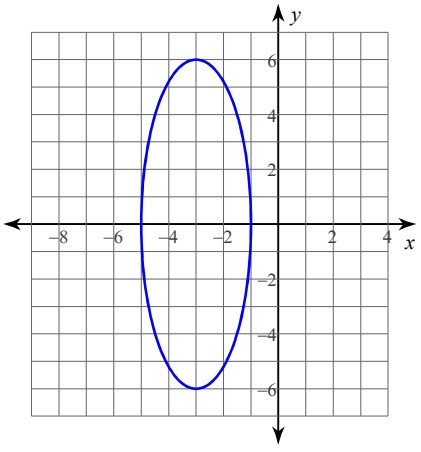
13) Vertices: $(-5, 7)$, $(-5, -9)$
Co-vertices: $(2, -1)$, $(-12, -1)$

14) Vertices: $(-1, 6)$, $(-1, -20)$
Co-vertices: $(9, -7)$, $(-11, -7)$

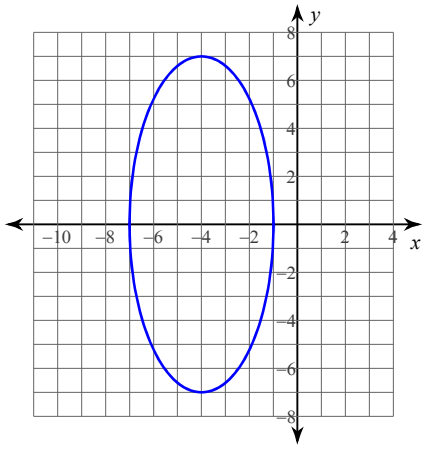
15) Vertices: $\left(\frac{17}{2}, 0\right)$, $\left(\frac{17}{2}, -20\right)$
Co-vertices: $\left(\frac{21}{2}, -10\right)$, $\left(\frac{13}{2}, -10\right)$

16) Vertices: $(3, 4)$, $(3, -18)$
Co-vertices: $(10, -7)$, $(-4, -7)$

17)



18)



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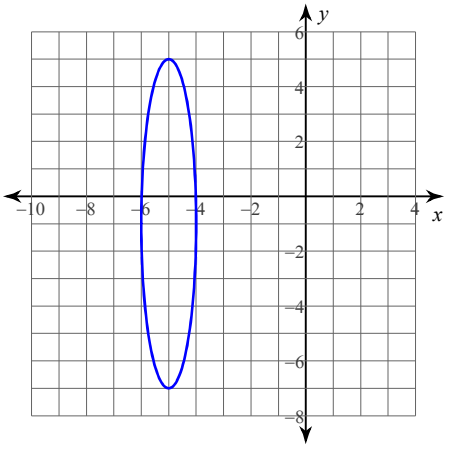
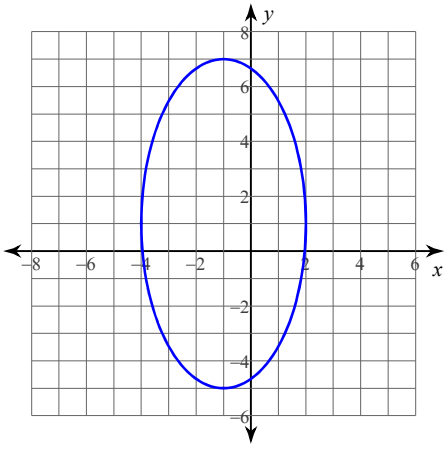


20)



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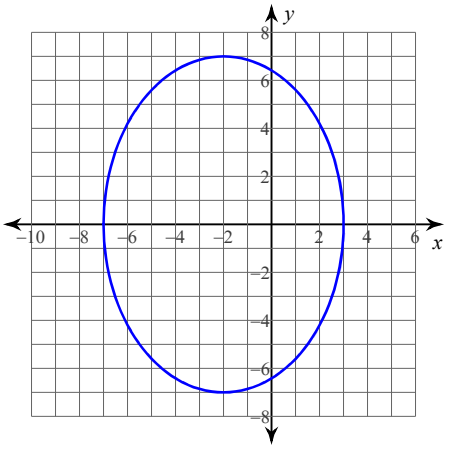
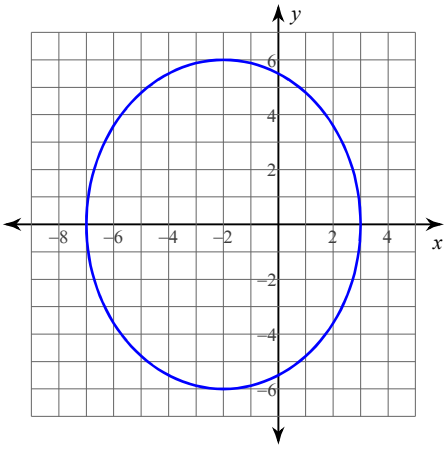


22)



Identify the center, vertices, and foci of each. Then sketch the graph.

23) $\frac{x^2}{49} + \frac{\left(y + \frac{7}{2}\right)^2}{9} = 1$

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

25) $\frac{x^2}{16} + \frac{(y-1)^2}{9} = 1$

26) $\frac{x^2}{15} + \frac{y^2}{10} = 1$

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

28) $\frac{(x+4)^2}{9} + \frac{(y-2)^2}{25} = 1$

29) $\frac{(x-2)^2}{16} + \frac{(y+3)^2}{9} = 1$

30) $\frac{x^2}{49} + \frac{(y-1)^2}{16} = 1$

Use the information provided to write the standard form equation of each circle.

31) Center: $(-8, -11)$
Radius: 8

32) Center: $(14, 15)$
Radius: 3

33) Center: $(5, -3)$
Radius: $\sqrt{43}$

34) Center: $\left(14, \frac{11}{2}\right)$
Radius: 3

35) Center: $(-2, -12)$
Point on Circle: $(-6, -15)$

36) Center: $(2, 16)$
Point on Circle: $(2, 19)$

37) Center: $(-4, -4)$
Point on Circle: $(-13, -7)$

38) Center: $(-1, 2)$
Point on Circle: $(10, -5)$

39) Ends of a diameter: $(-2, 5)$ and $(-4, 17)$

40) Ends of a diameter: $(5, 7)$ and $(-11, -5)$

41) Ends of a diameter: $(-7, 16)$ and $(3, 0)$

42) Ends of a diameter: $(-11, 12)$ and $(7, 6)$

43) Center: $(14, 14)$
Tangent to $x = 18$

44) Center: $(10, -9)$
Tangent to $x = 2$

45) Center: $(4, 9)$
Tangent to $y = 2$

46) Center: $(7, 0)$
Tangent to $y = 4$

47) $\sin^2 \theta + \cos^2 \theta$

48) $\csc \theta \cdot \tan \theta$

49) $\tan^2 \theta + 1$

50) $\sin -\theta$

51) $\dfrac{\sin^2 \theta}{1 - \cos^2 \theta}$

52) $\sec \theta - \tan \theta \cdot \sin \theta$

53) $\dfrac{\sin \theta - \cos \theta}{\sin \theta}$

54) $\dfrac{\cos \theta}{\sin \theta}$

Determine if the sequence is arithmetic. If it is, find the common difference and the term named in the problem.

55) $7,\ 15,\ 23,\ 31, \ldots$
Find a_{37}

56) $-38,\ -238,\ -438,\ -638, \ldots$
Find a_{24}

Given two terms in an arithmetic sequence find the common difference and the term named in the problem.

57) $a_{18} = -370$ and $a_{40} = -810$
Find a_{29}

58) $a_{17} = 106$ and $a_{40} = 221$
Find a_{21}

59) $a_{17} = 86$ and $a_{39} = 152$
Find a_{33}

60) $a_{17} = -146$ and $a_{39} = -366$
Find a_{25}

Evaluate each arithmetic series described.

61) $a_1 = 0,\ a_n = 42,\ n = 15$

62) $a_1 = -10,\ a_n = -112,\ n = 35$

63) $a_1 = 43,\ d = 9,\ n = 40$

64) $a_1 = -28,\ d = -7,\ n = 20$

65) $6 + 9 + 12 + 15 \ldots,\ n = 18$

66) $(-22) + (-26) + (-30) + (-34) \ldots,\ n = 16$

67) $\sum_{i=5}^{49} (10 - 6i)$

68) $\sum_{k=2}^{26} (2k - 10)$

69) $a_1 = 43,\ a_n = 153,\ n = 12$

70) $a_1 = 7,\ a_n = 43,\ n = 7$

71) $a_1 = 39,\ d = 8,\ n = 5$

72) $a_1 = 5,\ d = 4,\ n = 10$

73) $2 + 6 + 10 + 14...,\ n = 13$

74) $4 + 9 + 14 + 19...,\ n = 20$

75) $\sum_{k=4}^{11} (9k - 1)$

76) $\sum_{n=4}^{13} (3n - 4)$

Determine if the sequence is geometric. If it is, find the common ratio and the term named in the problem.

77) $-1,\ -4,\ -16,\ -64, ...$
Find a_9

78) $-3,\ -6,\ -12,\ -24, ...$
Find a_9

79) $2,\ -8,\ 32,\ -128, ...$
Find a_{10}

80) $1,\ 3,\ 9,\ 27, ...$
Find a_{10}

Given two terms in a geometric sequence find the common ratio and the term named in the problem.

81) $a_4 = 81$ and $a_1 = 3$
Find a_{10}

82) $a_1 = -3$ and $a_4 = -81$
Find a_{10}

83) $a_2 = 4$ and $a_3 = -8$
Find a_{10}

84) $a_5 = -162$ and $a_4 = 54$
Find a_{10}

Evaluate each geometric series described.

85) $-1 + 4 - 16 + 64...,\ n = 9$

86) $-1 - 4 - 16 - 64...,\ n = 6$

87) $a_1 = -2,\ a_n = -1458,\ r = 3$

88) $a_1 = -2,\ a_n = -781250,\ r = 5$

89) $\sum_{i=1}^{9} 3^{i-1}$

90) $\sum_{m=1}^{9} (-4)^{m-1}$

91) $a_1 = -3,\ r = 2,\ n = 10$

92) $a_1 = -3,\ r = 2,\ n = 7$

93) $-3 + 6 - 12 + 24...,\ n = 8$

94) $-4 + 12 - 36 + 108...,\ n = 7$

95) $a_1 = 2,\ a_n = -256,\ r = -2$

96) $a_1 = -2,\ a_n = 156250,\ r = -5$

97) $\sum_{n=1}^{9} 4 \cdot (-2)^{n-1}$

98) $\sum_{n=1}^{8} -4 \cdot (-2)^{n-1}$

99) $a_1 = -1,\ r = -4,\ n = 9$

100) $a_1 = 2,\ r = -3,\ n = 9$

Find the geometric mean in each geometric sequence for the given terms.

101) ..., −3, ___, −48, ...

102) ..., 2, ___, 72, ...

Find the missing side. Round your answers to the nearest tenth.

103) In ΔXYZ, $m\angle X = 129°$, $y = 22$, $z = 21$
Find x

104) In ΔBCA, $a = 18$, $c = 24$, $m\angle B = 113°$
Find b

105) In ΔYZX, $m\angle Y = 137°$, $x = 11.8$, $z = 8.5$
Find y

106) In ΔPQR, $q = 7$, $r = 12$, $m\angle P = 49°$
Find p

107) In ΔQRP, $m\angle R = 27°$, $m\angle P = 65°$, $r = 5$
Find p

108) In ΔBCA, $m\angle C = 46°$, $m\angle A = 54°$, $b = 11$
Find a

109) In ΔXYZ, $m\angle X = 61°$, $m\angle Y = 107°$, $z = 5$
Find y

110) In ΔDEF, $m\angle D = 65°$, $m\angle E = 88°$, $f = 10$
Find e

Find the area of each triangle to the nearest tenth.

111) In ΔSTR, $t = 9$, $r = 16$, $m\angle S = 81°$

112) In ΔCAB, $m\angle C = 139°$, $a = 15$, $b = 16$

113) In ΔFDE, $e = 4$, $m\angle F = 143°$, $d = 4$

114) In ΔEFD, $d = 7.7$, $m\angle E = 75°$, $f = 6$

115) In ΔPKH, $h = 12$, $p = 6$, $k = 12$

116) In ΔRST, $s = 6$, $r = 10.9$, $t = 8$

117) In ΔTRS, $t = 6$, $r = 10.2$, $s = 14$

118) In ΔRPQ, $p = 12$, $q = 14$, $r = 11$

Graph each function using degrees.

119) $y = 3\sin\theta$

120) $y = \sin\theta + 1$

121) $y = \frac{1}{2} \cdot \sin\theta$

122) $y = \sin\frac{\theta}{4}$

Using degrees, find the amplitude and period of each function.

123) $y = 2\sin 3\theta + 2$

124) $y = \sin(\theta + 135)$

125) $y = 4\sin\left(\frac{\theta}{3} - 150\right) - 3$

126) $y = \frac{1}{3} \cdot \sin\left(\frac{\theta}{8} + 150\right)$

127) $y = 7\sin(3\theta + 135) + 1$

128) $y = 2 + 5\sin(6\theta + 90)$

129) $y = \frac{1}{2} \cdot \sin\theta + 3$

130) $y = \frac{1}{5} \cdot \sin(5\theta + 45) - 5$

Answers to Practice for Q3Exam2 (ID: 1)

1) $\frac{(x-7)^2}{121} + \frac{(y-4)^2}{25} = 1$

2) $\frac{(x+6)^2}{196} + \frac{(y+2)^2}{81} = 1$

3) $\frac{(x+5)^2}{81} + \frac{(y-10)^2}{64} = 1$

4) $\frac{(x-7)^2}{9} + \frac{(y-8)^2}{144} = 1$

5) $\frac{(x+2)^2}{169} + \frac{(y-2)^2}{4} = 1$

6) $\frac{(x+4)^2}{30} + \frac{(y-3)^2}{20} = 1$

7) $\frac{(x-7)^2}{105} + \frac{(y-4)^2}{50} = 1$

8) $\frac{(x-5)^2}{75} + \frac{(y-3)^2}{30} = 1$

9) $\frac{(x+1)^2}{49} + \frac{(y-2)^2}{144} = 1$

10) $\frac{(x+7)^2}{25} + \frac{(y+5)^2}{100} = 1$

11) $\frac{(x+4)^2}{16} + \frac{(y+3)^2}{36} = 1$

12) $\frac{(x-2)^2}{16} + \frac{(y+1)^2}{100} = 1$

13) $\frac{(x+5)^2}{49} + \frac{(y+1)^2}{64} = 1$

14) $\frac{(x+1)^2}{100} + \frac{(y+7)^2}{169} = 1$

15) $\frac{\left(x-\frac{17}{2}\right)^2}{4} + \frac{(y+10)^2}{100} = 1$

16) $\frac{(x-3)^2}{49} + \frac{(y+7)^2}{121} = 1$

17) $\frac{(x+3)^2}{4} + \frac{y^2}{36} = 1$

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

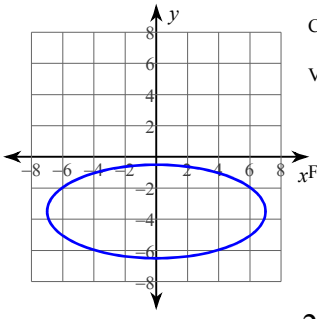
19) $(x+5)^2 + \frac{(y+1)^2}{36} = 1$

20) $\frac{(x+1)^2}{9} + \frac{(y-1)^2}{36} = 1$

21) $\frac{(x+2)^2}{25} + \frac{y^2}{49} = 1$

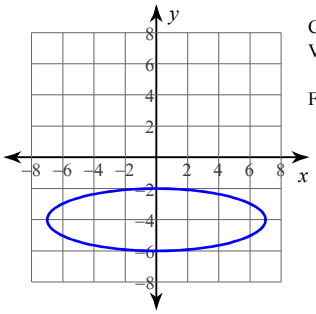
22) $\frac{(x+2)^2}{25} + \frac{y^2}{36} = 1$

23)



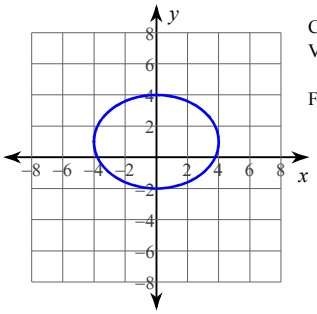
Center: $\left(0, -\frac{7}{2}\right)$
Vertices: $\left(7, -\frac{7}{2}\right)$ $\left(-7, -\frac{7}{2}\right)$
Foci: $\left(2\sqrt{10}, -\frac{7}{2}\right)$ $\left(-2\sqrt{10}, -\frac{7}{2}\right)$

24)



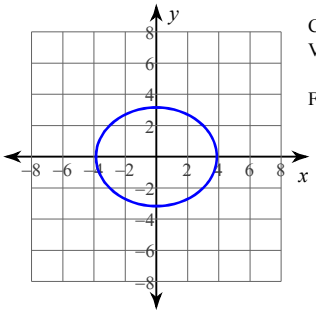
Center: $(0, -4)$
Vertices: $(7, -4)$ $(-7, -4)$
Foci: $(3\sqrt{5}, -4)$ $(-3\sqrt{5}, -4)$

25)



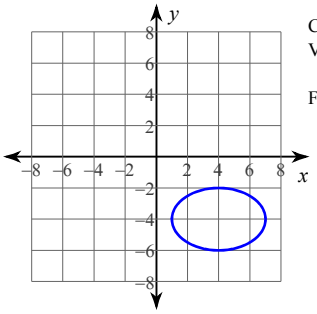
Center: $(0, 1)$
Vertices: $(4, 1)$ $(-4, 1)$
Foci: $(\sqrt{7}, 1)$ $(-\sqrt{7}, 1)$

26)

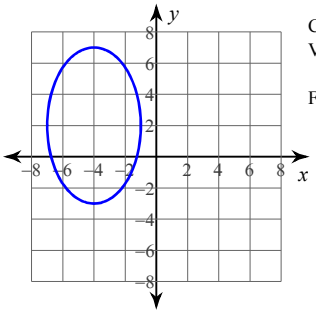


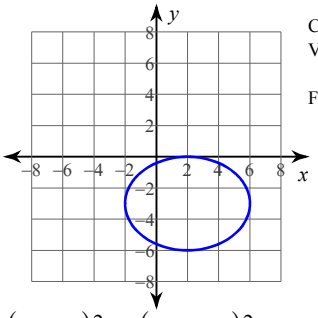
Center: $(0, 0)$
Vertices: $(\sqrt{15}, 0)$ $(-\sqrt{15}, 0)$
Foci: $(\sqrt{5}, 0)$ $(-\sqrt{5}, 0)$

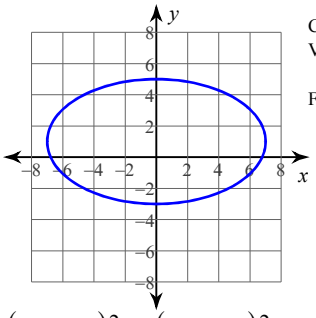
27)



Center: $(4, -4)$
Vertices: $(7, -4)$ $(1, -4)$
Foci: $(4 + \sqrt{5}, -4)$ $(4 - \sqrt{5}, -4)$

28) 

29) 

30) 

31) $(x+8)^2+(y+11)^2=64$

32) $(x-14)^2+(y-15)^2=9$

33) $(x-5)^2+(y+3)^2=43$

34) $(x-14)^2+\left(y-\frac{11}{2}\right)^2=9$

35) $(x+2)^2+(y+12)^2=25$

36) $(x-2)^2+(y-16)^2=9$

37) $(x+4)^2+(y+4)^2=90$

38) $(x+1)^2+(y-2)^2=170$

39) $(x+3)^2+(y-11)^2=37$

40) $(x+3)^2+(y-1)^2=100$

41) $(x+2)^2+(y-8)^2=89$

42) $(x+2)^2+(y-9)^2=90$

43) $(x-14)^2+(y-14)^2=16$

44) $(x-10)^2+(y+9)^2=64$

45) $(x-4)^2+(y-9)^2=49$

46) $(x-7)^2+y^2=16$

47) 1

48) $\sec\theta$

49) $\sec^2\theta$

50) $-\sin\theta$

51) 1

52) $\cos\theta$

53) $1-\cot\theta$

54) $\cot\theta$

55) Common Difference: $d=8$
$a_{37}=295$

56) Common Difference: $d=-200$
$a_{24}=-4638$

57) Common Difference: $d=-20$
$a_{29}=-590$

58) Common Difference: $d=5$
$a_{21}=126$

59) Common Difference: $d=3$
$a_{33}=134$

60) Common Difference: $d=-10$
$a_{25}=-226$

61) 315

62) –2135

63) 8740

64) –1890

65) 567

66) –832

67) –6840

68) 450

69) 1176

70) 175

71) 275

72) 230

73) 338

74) 1030

75) 532

76) 215

77) Common Ratio: $r=4$
$a_9=-65536$

78) Common Ratio: $r=2$
$a_9=-768$

79) Common Ratio: $r=-4$
$a_{10}=-524288$

80) Common Ratio: $r=3$
$a_{10}=19683$

81) Common Ratio: $r=3$
$a_{10}=59049$

82) Common Ratio: $r=3$
$a_{10}=-59049$

83) Common Ratio: $r=-2$
$a_{10}=1024$

84) Common Ratio: $r=-3$
$a_{10}=39366$

85) –52429

86) –1365

87) –2186

88) –976562

89) 9841

90) 52429

91) –3069

92) –381

93) 255

94) –2188

95) –170

96) 130208

97) 684

98) 340

99) –52429

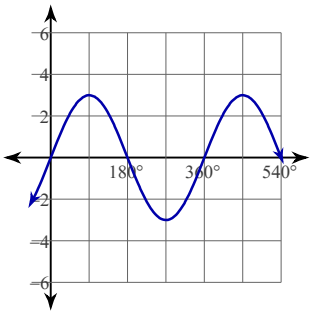
100) 9842

101) –12

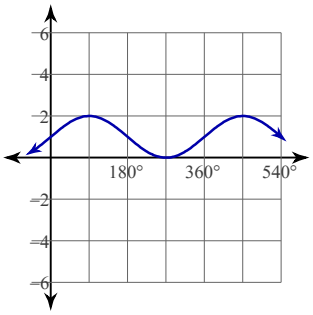
102) 12

103) 38.8
104) 35.2
105) 18.9
106) 9.1
107) 10
108) 9
109) 23
110) 22
111) 71.1 units²
112) 78.7 units²
113) 4.8 units²
114) 22.3 units²
115) 34.9 units²
116) 23.5 units²
117) 27.2 units²
118) 63.7 units²

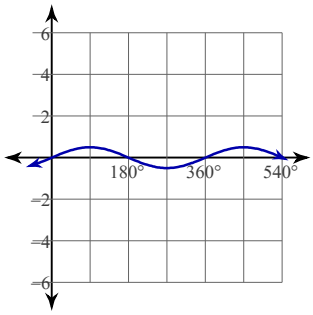
119)



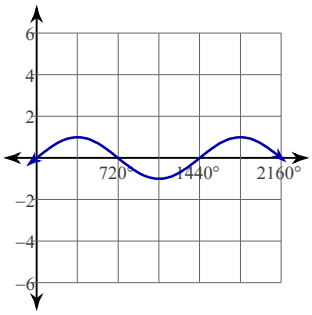
120)



121)



122)



123) Amplitude: 2
Period: 120°

124) Amplitude: 1
Period: 360°

125) Amplitude: 4
Period: 1080°

126) Amplitude: $\frac{1}{3}$
Period: 2880°

127) Amplitude: 7
Period: 120°

128) Amplitude: 5
Period: 60°

129) Amplitude: $\frac{1}{2}$
Period: 360°

130) Amplitude: $\frac{1}{5}$
Period: 72°