

MATH122
Final Exam Review Answers

1. $A = 19^\circ$, $b = 17.43$, $c = 18.43$

2. $\sin \theta = \sqrt{55}/8$

3a. 24.294; b. $49^\circ 15' 14''$

4a. 49.93° ; b. 78.46°

5a. 0.96; b. 0.93

6. sec, sin

7. yes

8. 91.58 ft

9. 51.32 km

10. 597° , -123° , or others

11.
$$\begin{cases} \sin \theta = -3\sqrt{10}/10, \csc \theta = -\sqrt{10}/3 \\ \cos \theta = \sqrt{10}/10, \sec \theta = \sqrt{10} \\ \tan \theta = -3, \cot \theta = -1/3 \end{cases}$$

12. $-2\sqrt{53}/53$

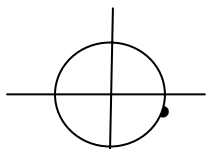
13. 298.43°

14. $\cos 45^\circ = \sqrt{2}/2$, $\tan 150^\circ = -\sqrt{3}/3$

15. 0.9945, -1.1924

16. 698.81 mi

17.



18. $17\pi/7$, $-11\pi/7$, or others

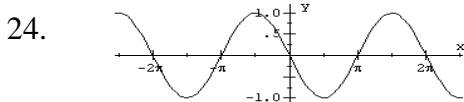
19. $\pi/10$, $3\pi/5$

20. 135° , 3.42 radians

21. 1120.45 rev/min

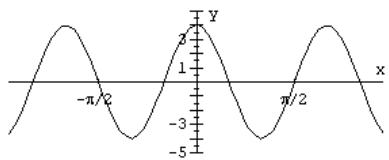
22a. $\sqrt{3}/3$ b. $-\sqrt{2}$ c. undefined

23. -0.76, -1.03

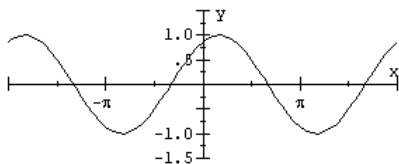


25. 2, $2\pi/3$, $-\pi/6$

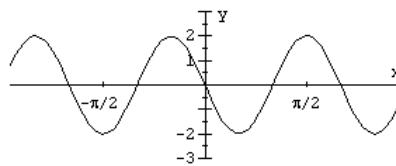
26a



b.

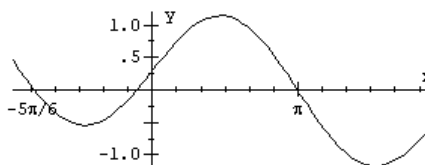


c



27. $y = 0.5 \sin(2x + \pi/3)$

28.



29. $\sin 135^\circ = \sqrt{2}/2$

30a. $\sqrt{\sin 2x}/\cos x$ b. $\sqrt{1 + \cos x}$

31. $5|\cos \theta|$

32. $\frac{\sqrt{2}(1 - \sqrt{3})}{4}$

33. $\frac{3\sqrt{21} - 4}{5\sqrt{13}}$

34a. $-4\sqrt{2}/9$ b. $-\sqrt{2}/3$ or $-\sqrt{6}/3$

35. $1 - \sin \theta$

36. $\sec^4 x - \tan^4 x = 1 + 2 \tan^2 x$
 $(\sec^2 x + \tan^2 x) \underbrace{(\sec^2 x - \tan^2 x)}_{=1} =$

$1 + \tan^2 x + \tan^2 x =$

$1 + 2 \tan^2 x =$

37. $-\pi/6$

38a. $-\pi/2$ b. $\sqrt{5}/3$

39a. $\frac{\sqrt{4-b^2}}{b}$ b. $\frac{2a+7\sqrt{5}}{3\sqrt{a^2+49}}$

40a. $\pm \frac{5\pi}{6} + 2k\pi$, k an integer

b. $\frac{7\pi}{6} + 2k\pi$, $\frac{11\pi}{6} + 2k\pi$, $\frac{\pi}{2} + 2k\pi$; k an integer

c. $2k\pi$, $\frac{\pi}{2} + k\pi$; k an integer

41. ± 1.02

42a. $A = 51^\circ$, $b = 2.34$, $c = 5.03$

b. $A_1 = 49.17^\circ$, $C_1 = 103.83^\circ$, $c_1 = 12.83$

$A_2 = 130.83^\circ$, $C_2 = 22.17^\circ$, $c_2 = 4.99$

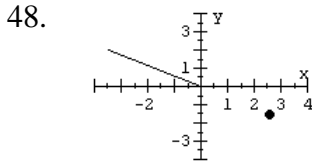
43. 111,874 feet (about 21.2 mi) measured from plane to end of runway through the air
 106871 feet (about 20.2 mi) measured along the ground

44. $A = 47.38^\circ$, $B = 96.55^\circ$, $C = 36.07^\circ$

45. 18.31 mi

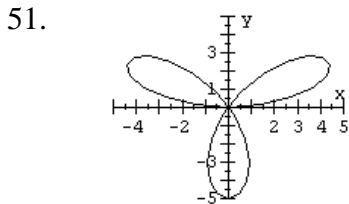
46. $\left(-\frac{3}{2}, -\frac{3\sqrt{3}}{2}\right)$

47. $\left(2\sqrt{2}, -\frac{\pi}{4}\right)$



49. $x^2 + y^2 = 6y$

50. $r = 10\sin\theta$



52. 35.10, 31.53°

53. 103.52°

54. $\langle -4, 11 \rangle$

55. $\langle -10, -13 \rangle$

56. $\frac{3}{5}\mathbf{i} - \frac{4}{5}\mathbf{j}$

57. 126.87°

58. 67.13°

59. 98.30°, 118.45 mi

60. (3, -5)

61. 10% solution: $43\frac{1}{3}$ ml
 40% solution: $56\frac{2}{3}$ ml

62. (1, -2, 4)

63. 5 touchdowns, 4 extra point kicks, and 2 field goals

64. (2.5, 7.4, -3.8)

65. $\left(\frac{3}{4} - \frac{1}{4}c, -\frac{1}{4} + \frac{7}{4}c, c\right)$, c any real number

66. $\frac{1}{3}, \frac{2}{5}, \frac{3}{7}, \frac{4}{9}$

67. $a_n = \frac{n+1}{n^2+1}$

68a. 90 b. 90

69. $\sum_{k=1}^5 \frac{2k+1}{k+1}$

70. 3, 7, 15, 31, 63

71. 82

72. 91

73. $575/3$

74. 3456

75. $59049/128$

76. $24(-0.5)^{n-1}$

77. $12285/256$

78. 48

79. $4111/990$

80. \$1,317,081.10

81a. 990 b. 5040

82. 1320

83a. 15 b. 56

84. 15,890,700

85a. $32x^5 - 240x^4 + 720x^3 - 1080x^2 + 810x - 243$

b. $\frac{1}{x^4} + \frac{8}{x^3} + \frac{24}{x^2} + \frac{32}{x} + 16$

86. $-\frac{12155}{x^7}$

87. 0.2076

88. $V(-3, 2)$, $F(-3, 1)$,
 $y = 3$

89. a. $x^2 = 60y$

b. 15 in.

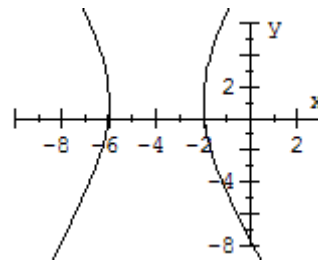
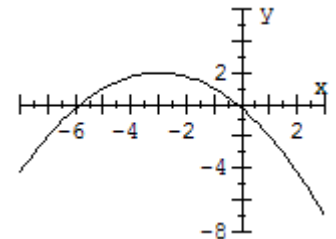
90. $C(-1, 1)$; 2

91. $V(\pm 3, 0)$, $F(\pm\sqrt{5}, 0)$

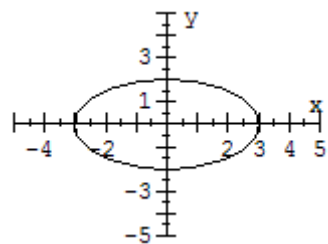
92. $\frac{x^2}{16} + \frac{y^2}{25} = 1$

93. $C(-4, 1)$, $V(-4 \pm 2, 1)$, $F(-4 \pm \sqrt{29}, 1)$

$\frac{y-1}{5} = \pm \frac{x+4}{2}$



94.



$$\frac{x^2}{9} + \frac{y^2}{4} = 1$$

95. a. 83.95 ft
b. 266.2 ft