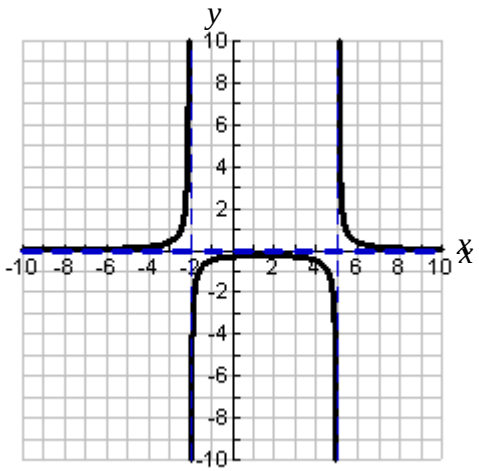
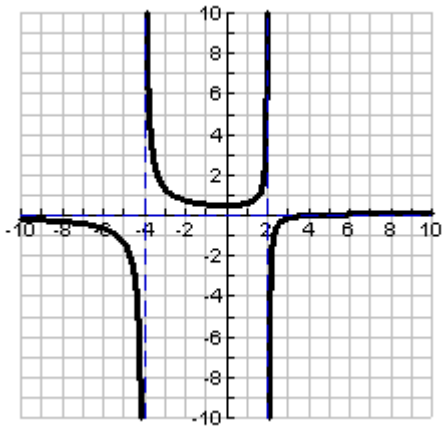
There may be instances where your decimal approximation is slightly different from the given answer, depending on how you may have rounded during the solving of the problem.

1.



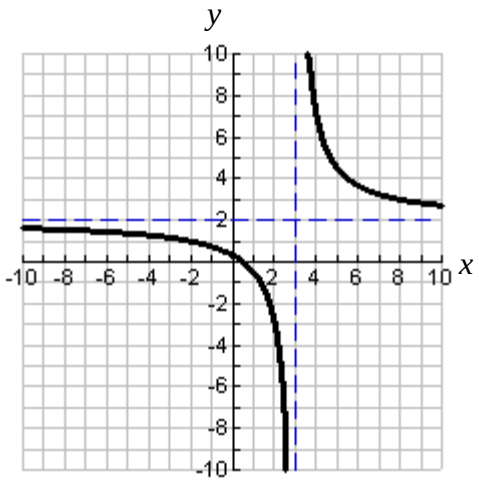
Vertical Asymptotes: $x = -2, x = 5$
Horizontal Asymptote: $y = 0$
x-intercept: none
y-intercept: $\left(0, -\frac{3}{10}\right)$

2.



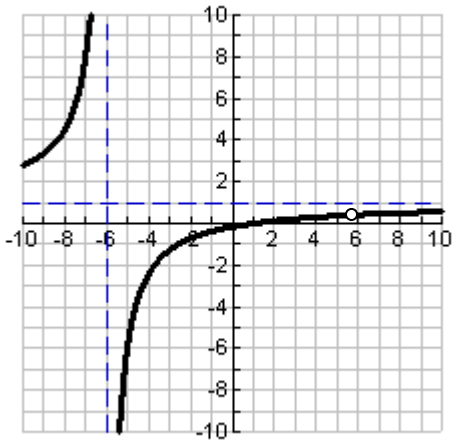
Vertical Asymptotes: $x = -4, x = 2$
Horizontal Asymptote: $y = 0$
x-intercept: $(4, 0)$
y-intercept: $\left(0, \frac{1}{2}\right)$

3.



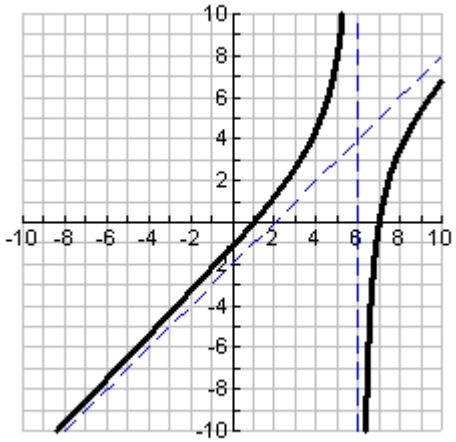
Vertical Asymptote: $x = 3$
Horizontal Asymptote: $y = 2$
x-intercept: $\left(\frac{1}{2}, 0\right)$
y-intercept: $\left(0, \frac{1}{3}\right)$

4.



Vertical Asymptote: $x = -6$
Horizontal Asymptote: $y = 1$
Domain: $x \neq -6, x \neq 6$
Range: $y \neq 1, y \neq \frac{5}{12}$
Removable Discontinuity: $\left(6, \frac{5}{12}\right)$
x-intercept: $(1, 0)$
y-intercept: $\left(0, -\frac{1}{6}\right)$

5.



Vertical Asymptote: $x = 6$
Horizontal Asymptote: none
Oblique Asymptote: y = x - 2
Domain: $x \neq 6$
Range: all real numbers
Removable Discontinuity: none
x-intercept: $(1, 0), (7, 0)$
y-intercept: $\left(0, -\frac{7}{6}\right)$

6. **D**

7. $x = -5, x = 2$

8. $x = -2$ ($x = 4$ is extraneous)

9. $(0, 2)$

10. $(-5, -2) \cup [3, \infty)$

11. $\frac{5}{x-2} + \frac{8}{x-3}$

12. $\frac{3}{x+1}-\frac{3}{x-2}$

13. $-\frac{1}{12}$

14. **D**

15. **B**

16. **B**

17. **C**

18. **C**

19. 4.543

20. – 3.173

21. $g(x)=-3^{x+5}$

22. $g(x)=9^{-\frac{x}{7}}$

23. $x=\frac{1}{2}\ln 19$

24. $x = 5.675$

25. $x=\frac{\frac{\log 100}{\log 2}+1}{3}\approx 2.548$

26. $x=e^2-4\approx 3.389$

27. $x=\frac{50}{3}$

28. $x=5\left(x=-1 \text{ is extraneous}\right)$

29. $x=3$

30. $x=5$

31. a. $N(t) = 600 \cdot 3^{\frac{t}{4}}$

b. $N(7) = 4103$

c. $t = 10.907$ weeks or about 11 weeks

32. $r = .115 = 11.5\%$ per year

33. approximately 3 years

34. a. 1300
b. .04 or 4% per year (continuous growth rate)
c. 1939
d. 16.348 years

35. a. 78%
b. 16.575 years

36. a. Domain: $(-2, \infty)$, Range: All real numbers

b. $x = -2$

c. reflect about the *x*-axis, translate two units left and 5 units down

37. a. 1500
b. 1.5 weeks
c. 30000

38. 6.982 minutes

39. $y = 2x - 7$

40. $y = 2x - 3$

41. $\frac{x^2}{25} + \frac{y^2}{64} = 1$

42. a. $x = 132\cos(20^o)t$ or $124.039t$

$y = -16t^2 + 132\sin(20^o)t$ or $-16t^2 + 45.147t$

b. $x = 248.079$ feet, $y = 26.293$ feet

43. a. $x = 82\cos\left(63^o\right)t$ or $x = 37.227t$

$y = -16t^2 + 82\sin\left(63^o\right)t + 2$ or $-16t^2 + 73.063t + 2$

b. $x = 55.841$ feet $y = 75.594$ feet

c. When the ball is 150 feet from the punter ($t = 4.029$), the ball is at a height of 36.6 ft. Since the kick returner is 6 ft tall, the ball goes over his head.

d. The ball hits the ground at $t = 4.594$ sec about 171 feet from the punter.

44. $\langle x, y\rangle = \langle 1, 4\rangle + t\langle 2, 5\rangle$ *or* $\langle x-1, y-4\rangle = t\langle 2, 5\rangle$

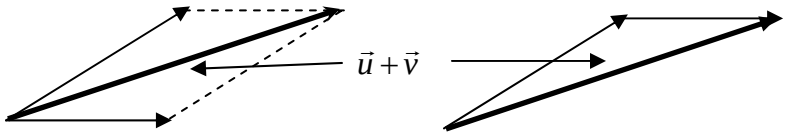
$x = 1 + 2t$

$y = 4 + 5t$

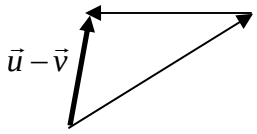
45. **B**

46. Magnitude 10, Direction 126.87^o

47.



48.



49. -3

50. 96.116^o

51. $r = 6$

52. $r = 7.5$

53. a. $\langle 1, 7, -9\rangle$

b. $\sqrt{131}$

54. a. 68.213^{o}
    b. $\langle -11,-19,-5\rangle$
    c. A vector perpendicular to the two given vectors
    d. $\langle 2,4,-3\rangle + t\langle -4,1,5\rangle$

55. a. 444.456 mph
    b. 5.478^{o} north of due west

56. $\left(4, 4\sqrt{3}\right)$

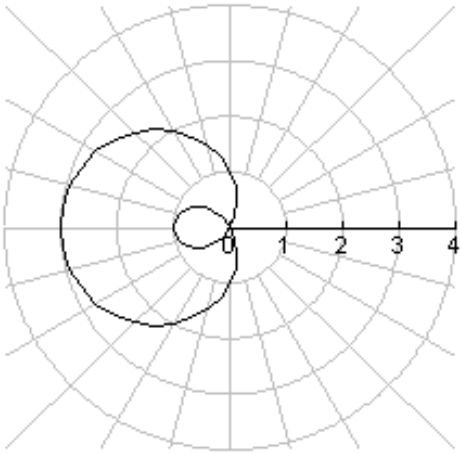
57. $\left(-2\sqrt{2}, -2\sqrt{2}\right)$

58. $\left(8, \frac{5\pi}{3}\right)$

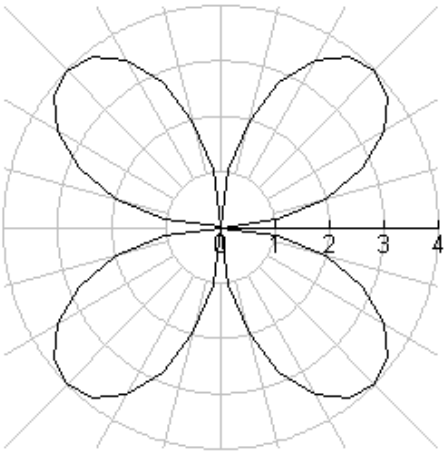
59. $\left(\sqrt{2}, \frac{5\pi}{4}\right)$

60. **B**

61.



62.



63. $r = \dfrac{9}{\cos\theta + \sin\theta}$

64. $r = \dfrac{7}{\cos\theta} = 7\sec\theta$

65. $y = 6$

66. $2x + 5y = 3$

67. $12\left(\cos\dfrac{7\pi}{6} + i\sin\dfrac{7\pi}{6}\right)$

68. $\sqrt{12}\left(\cos\dfrac{\pi}{3} + i\sin\dfrac{\pi}{3}\right)$

69. $3 - 3i\sqrt{3}$

70. $2 + 0i = 2$

71. $2\left(\cos\dfrac{\pi}{4} + i\sin\dfrac{\pi}{4}\right)$

72. $81\left(\cos 220^o + i\sin 220^o\right)$

73. $\left(\frac{2}{3}, 70.529^o\right), \left(\frac{2}{3}, 289.471^o\right), \left(-2, 180^o\right)$

74. $(0,0), (0,\pi), \left(\frac{\sqrt{3}}{2}, \frac{\pi}{6}\right), \left(-\frac{\sqrt{3}}{2}, \frac{11\pi}{6}\right)$

75. $(4,0,0), (0,10,0), (0,0,-5)$

76. $\sum_{n=1}^{\infty} 8 \cdot 2^{n-1}$ or $\sum_{n=0}^{\infty} 8 \cdot 2^{n}$

77. $\sum_{n=1}^{7} 11 + 4(n-1) = \sum_{n=1}^{7} 7 + 4n$ or $\sum_{n=0}^{6} (11 + 4n)$

78. 13.5

79. No sum or ∞

80. 24

81. 34

82. 104

83. $\frac{1}{1-x}$

84. $x^4 - 8x^3 + 24x^2 - 32x + 16$

85. 40

86. 20