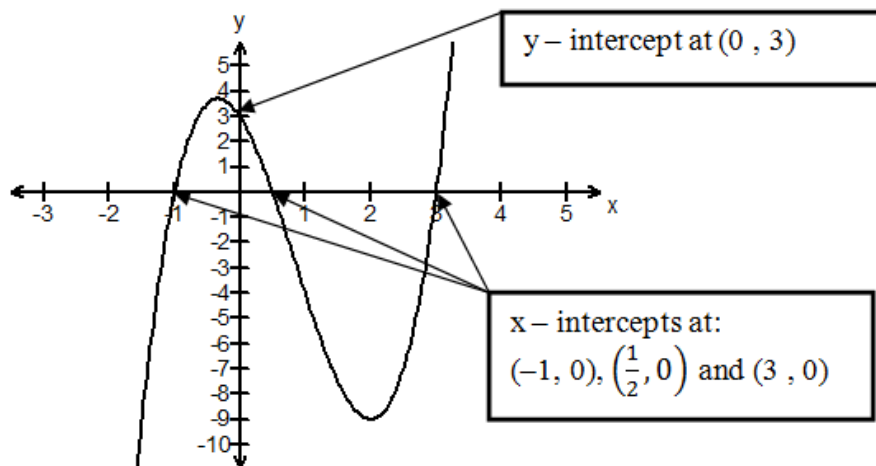


ANSWERS:

1. D 2. C 3. A 4. B 5. A 6. D 7. B 8. C 9. D 10. C 11. A 12. C 13. B
 14. A 15. A 16. D 17. B 18. B 19. B 20. A 21. D 22. C 23. C 24. D 25. B 26. A
 27. D 28. B 29. C 30. D 31. C 32. B 33. A 34. C 35. A 36. C 37. A 38. D 39. B
 40. A 41. B 42. C 43. D 44. A 45. D 46. C 47. A 48. B 49. B 50. C

51.(a)



51.(b) $f(x) = x^3 - 3x^2 - 6x + 8$

Note: To have a rectangular prism we must have $f(x) > 0$ and $x > 0$. To have a positive dimension for length, width and height we cannot consider values for x where $x < 4$ otherwise some of the dimensions will be less than 0. Therefore, positive dimensions and volume occurs when $x > 4$.

52.(a)

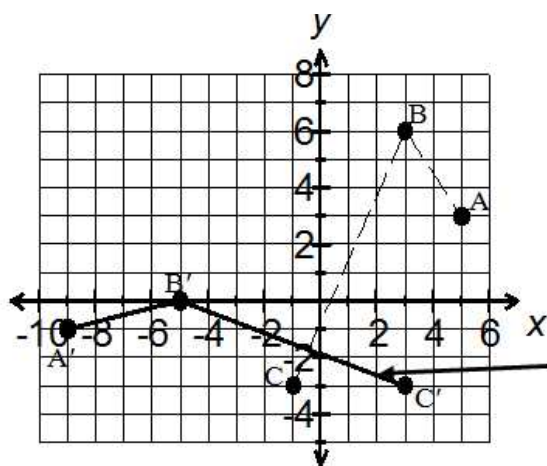
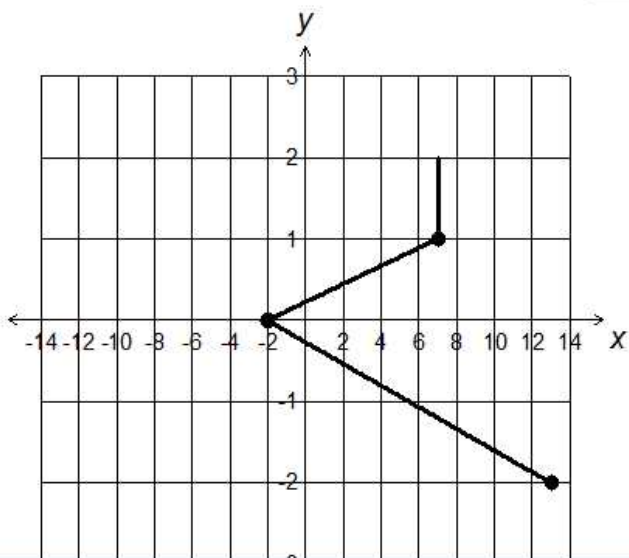
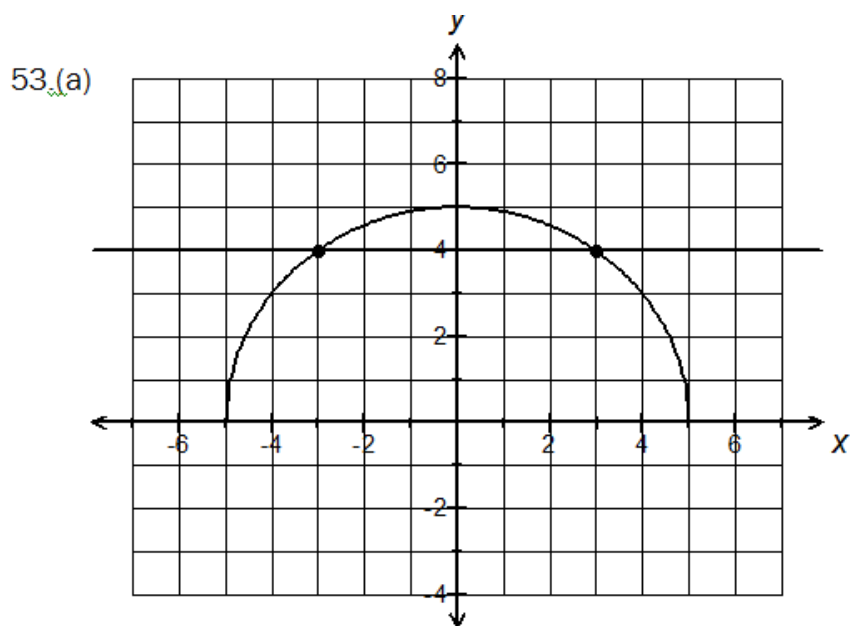


Image Function:

$$y = \frac{1}{3}f\left(-\frac{1}{2}(x - 1)\right) - 2$$

52.(b)





Solutions:
 $x = -3$ and 3

- 53.(b) (i) Invariant points $\left(\frac{q}{p}, 0\right)$ and $\left(\frac{q-1}{p}, 1\right)$.
 (ii) Domain $x \leq \frac{q}{p}$ Range $y \geq 0$

54. $-\frac{2\sqrt{3}}{3}$

55.(a) $\theta = 3\pi + 4\pi n, n \in \mathbb{I}, \theta = 4\pi n, n \in \mathbb{I}$

56.(a) $-\frac{16}{65}$

56.(b)

➤ $\frac{2\sin x \cos x}{1-(1-2\sin^2 x)}$
➤ $\frac{2\sin x \cos x}{1-1+2\sin^2 x}$
➤ $\frac{2\sin x \cos x}{2\sin^2 x}$
➤ $\frac{\cos x}{\sin x}$
➤ $\cot x$

56.(c) $\frac{2\pi}{3}, \frac{5\pi}{6}, \frac{5\pi}{3}, \frac{11\pi}{6}$

57.(a) $\frac{11}{3}$ 57.(b) 12 years

58.(a) $x = 8$ 58.(b) $10^{-0.8} \text{ W/m}^2$ or 0.158 W/m^2

59.(a) $a^6 - 18a^3 + 135 - \frac{540}{a^3} + \frac{1215}{a^6} - \frac{1458}{a^9} + \frac{729}{a^{12}}$

59.(b) $n = 20$