AP Calculus AB Summer Assignment - Answer Key

1. Transformations: Left 2, down 1; vertical stretch by 3. Sketch: Cubic shifted accordingly.
2. Transformations: Right 3, reflect over x-axis, up 2. Sketch: Parabola adjusted.
3. Transformations: Right 4, reflect over y-axis, down 3. Sketch: Cubic mirrored and shifted.
4. Transformations: Left 2, up 4. Sketch: Logarithmic curve shifted.
5. Transformations: Reflect over x-axis, left 5, down 3. Sketch: Exponential decay.

6. x = -6, x = 2.5
7. x = -1, x = 3
8. x = 0, x = ±3
9. x = 0, x = 2, x = 3
10. (x^2 + 2x + 2)(x^3 + 8)
11. (x^2 - 3x + 9)(x + 3)(x - 3)

12. 1, 13. √3/2, 14. 1, 15. √3/2, 16. -1/2, 17. 0
18. 2√2/3, 19. 2, 20. 0, 21. 2, 22. -2, 23. 1

Limits:
24. 7, 25. Undefined, 26. 2, 27. 0, 28. 0, 29. -1
30. 3, 31. 0, 32. 0

Graph-based Limits:
33. Value at left of -2, 34. Right of -2, 35. At -2 if both match.
36. Value as $x \to -\infty$, 37. Value as $x \to \infty$, 38. Value at left of 3
39. Repeat of 33, 40. Right of 3, 41. Value at 3

42. y + 6 = (3/2)(x - 2); y = (3/2)x + b
43. m = -4; y + 3 = -4(x - 4); y = -4x + 13
44. m = 2/3; y + 4 = (2/3)(x - 3); y = (2/3)x - 6

45. a) 25, b) 6, c) $2t^2 - 5t + 2$, d) $2(x + h)^2 - 5(x + h) + 2$, e) $2(1 + h)^2 - 5(1 + h) + 2$
46. Plug values into function.
47. Same as 45, different polynomial.

48. Hole at x = -3, VA at x = 5, HA at y = 2, X-int at x = -5, Y-int at y = -10/3

49. Average rate of change = (f(b) - f(a)) / (b - a)
50. 1, 51. 0, 52. 1
53. x^(2/3)
54. (2^2 * x^(4/3) * y^(-1/2)) / (z^6 * w^(-1))
55. f'(x) = lim(h→0) [f(x + h) - f(x)] / h