

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. $x = 0$, $x = \pm 3$

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. $\sqrt{3}/2$, 14. 1, 15. $\sqrt{3}/2$, 16. $-1/2$, 17. 0

18. $2\sqrt{2}/3$, 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 $x \rightarrow -\infty$, 37. Value as $x \rightarrow \infty$, 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. $f'(x) = \lim_{h \rightarrow 0} [f(x + h) - f(x)] / h$