

Pre Calculus Review For AP Calculus

Factor Completely:

1. $8x^2 - 2x - 3$

2. $8g^6 - 125$

3. $81w^4 - 16$

4. $x^4 - 25x^2 + 144$

5. $3a^2b^2 + ab - 24$

6. $3u^2 + uv - 10v^2$

7. $50x^3y^2 + 40x^2y^3 + 8xy^4$

8. $64xy^2 - 9x^3$

9. $64n^3 + 1$

10. $12x^2 + 43x + 36$

11. $x^6 - y^6$

12. $6t^2 - 11t - 10$

13. $p^{3n} - q^{3n}$

14. $25k^{2m} - 10k^m + 1$

15. $7x^{4y} - 11x^{2y} - 6$

16. $d^{4k+1} - 5d^{2k+1} + 4d$

Simplify:

17. $\frac{x-4}{x^2-3x-4}$

18. $\frac{x^3-8}{x-2}$

19. $\frac{5-x}{x^2-25}$

20. $\frac{x^2-4x-32}{x^2-16}$

21. $\frac{1}{x+h} - \frac{1}{x}$

22. $\frac{\frac{2}{x^2}}{\frac{10}{x^5}}$

23. $\frac{\frac{1}{3+x} - \frac{1}{3}}{x}$

24. $\frac{4xy^{-2}}{12x^{\frac{-1}{3}}y^{-5}}$

25. $\frac{2x}{x^2-6x+9} - \frac{1}{x+1} - \frac{8}{x^2-2x-3}$

26. $\left(\frac{2x^2y^{-2}}{3x^4y^5}\right)^{-2} \left(\frac{3x^{-1}y}{4x^2y^{-3}}\right)^{-3}$

Solve over the set of real numbers. Express inequalities in interval notation:

$$27. x^2 + 3x - 4 = 14 \quad 28. \frac{x^4 - 1}{x^3} = 0 \quad 29. (x - 5)^2 = 9 \quad 30. 2x^2 + 5x = 8$$

$$31. (x + 3)(x - 3) > 0 \quad 32. x^2 - 2x - 15 \leq 0 \quad 33. 12x^2 = 3x \quad 34. \frac{2x - 7}{x - 5} \leq 3$$

$$35. |x - 3| < 7 \quad 36. (x + 1)^2(x - 2) + (x + 1)(x - 2)^2 = 0 \quad 37. 27^{2x} = 9^{x-3}$$

$$38. \log x + \log(x - 3) = 1 \quad 39. e^{3k} = 5 \quad 40. \sin 2x - \sin x = 0, 0 \leq x < 2\pi$$

If $f(x) = 2x + 3$ and $g(x) = x^2 + 1$ find the following:

$$41. f(g(x)) \quad 42. g(f(x)) \quad 43. \frac{f(x+h) - f(x)}{h} \quad 44. \frac{g(x+h) - g(x)}{h}$$

(Re)Memorize the following identities from Trigonometry. These are the most useful identities in Calculus.

$$45. \sin^2 x + \cos^2 x = 1 \quad 46. \tan^2 x + 1 = \sec^2 x \quad 47. \cot^2 x + 1 = \csc^2 x$$

$$48. \sin 2x = 2 \sin x \cos x \quad 49. \cos 2x = \cos^2 x - \sin^2 x = 2 \cos^2 x - 1 = 1 - \sin^2 x$$

List the values of sine, cosine, tangent, cosecant, secant, and cotangent for each angle in radians. You should have the sine and cosine memorized:

$$50. 0 \quad 51. \frac{\pi}{2} \quad 52. \pi \quad 53. \frac{3\pi}{2} \quad 54. \frac{\pi}{3} \quad 55. \frac{2\pi}{3} \quad 56. \frac{4\pi}{3} \quad 57. \frac{5\pi}{3}$$

$$58. \frac{\pi}{4} \quad 59. \frac{3\pi}{4} \quad 50. \frac{5\pi}{4} \quad 51. \frac{7\pi}{4} \quad 52. \frac{\pi}{6} \quad 53. \frac{5\pi}{6} \quad 54. \frac{7\pi}{6} \quad 55. \frac{11\pi}{6}$$

Solve over the set $[0, 2\pi)$:

$$56. 6\sin x - 3\sqrt{2} = 0 \quad 57. 2\sqrt{3}\cot x - 3 = 5\sqrt{3}\cot x \quad 58. 9\tan^2 x = 3$$

$$59. \sec x + 4\sqrt{3} = 7\sec x \quad 60. \sec x \csc x - \sec x = 0 \quad 61. \tan^2 x = 3$$

$$62. 2\sin^2 x + 1 = -3\sin x \quad 63. \cot^4 x - 2\cot^2 x - 3 = 0 \quad 64. \cos 2x = -\frac{1}{2}$$