

1. $x = \underline{\hspace{2cm}}$ $e^{2x} - 2e^x - 3 = 0$
2. $x = \underline{\hspace{2cm}}$ $\frac{1}{2}x - 8x^{1/3} = 0$
3. $x = \underline{\hspace{2cm}}$ $2^x = 3e^{4x}$
4. $x = \underline{\hspace{2cm}}$ $1 - \frac{1}{1+x} = k$
5. $x = \underline{\hspace{2cm}}$ $e^{x-2} = k \cdot 4^x$
6. $x = \underline{\hspace{2cm}}$ $4x^3 e^{kx} - 16x e^{kx} = 0$
7. $x = \underline{\hspace{2cm}}$ $2 \ln(5x) = \ln(x+2)$

8. $x = \underline{\hspace{2cm}}$ $(2x+5)^2 + 5(2x+5) - 36 = 0$
9. $x = \underline{\hspace{2cm}}$ $10^{2x} + 3(10^x) - 10 = 0$
10. $x = \underline{\hspace{2cm}}$ $3(2^{2t}) - 11(2^t) - 4 = 0$
11. $x = \underline{\hspace{2cm}}$ $\sqrt{x+9} - 2 = \sqrt{x-3}$
12. $x = \underline{\hspace{2cm}}$ $\frac{x}{12} - \frac{2}{x} = \frac{1}{x}$
13. $x = \underline{\hspace{2cm}}$ $\left(\frac{1}{x+8}\right)^2 + \frac{1}{x+8} - 6 = 0$
14. $x = \underline{\hspace{2cm}}$ $x^4 + 2x^2 = 3$
15. $x = \underline{\hspace{2cm}}$ $\frac{1}{x-1} + 4 = \frac{1}{5}$
16. $x = \underline{\hspace{2cm}}$ $(x+5)(x-2) = 8$
17. $z = \underline{\hspace{2cm}}$ $3az + 1 = 3a - 4z$
18. $z = \underline{\hspace{2cm}}$ $\frac{12}{z} - \frac{7}{z+1} = 1$
19. $y = \underline{\hspace{2cm}}$ $0 = 12y^2 + 12y - 24$
20. $w = \underline{\hspace{2cm}}$ $\ln(w+2) = \ln(w) + \ln(5)$
21. $t = \underline{\hspace{2cm}}$ $P = 10e^{kt}$
22. $t = \underline{\hspace{2cm}}$ $2^t = e^{t-2}$
23. $t = \underline{\hspace{2cm}}$ $t^2 e^{3t} + 9te^{3t} = 0$
24. $t = \underline{\hspace{2cm}}$ $\ln(t) + (2t) = \ln(8)$
25. $t = \underline{\hspace{2cm}}$ $5 \log(t) = 3$
26. $t = \underline{\hspace{2cm}}$ $t^4 - 9t = 0$
27. $n = \underline{\hspace{2cm}}$ $\frac{(n^2 - 2)(3n + 5)}{n - 3} = 0$
28. $p = \underline{\hspace{2cm}}$ $\frac{(p^2 - 5)(p + 3)^2}{p + 1} = 0$
29. $w = \underline{\hspace{2cm}}$ $\log(w) + \log(w+1) = \log(20)$

30. $L = \underline{\hspace{2cm}}$ $T = \frac{1}{2\pi} \sqrt{\frac{L}{g}}$

31. $\theta = \underline{\hspace{2cm}}$ $\frac{(1 - 2\mu\theta)(\mu + \theta) - (\theta - \mu\theta^2)}{(\mu + \theta^2)} = 0$ Assume $\mu > 0$

32. Simplify $\frac{k(x^2 + r_0^2)^{3/2} - kx\left(\frac{3}{2}\right)(x^2 + r_0^2)^{1/2}(2x)}{\left((x^2 + r_0^2)^{3/2}\right)^2}$

33. $x = \underline{\hspace{2cm}}$ $-14kx^{-3} + 2k(20 - x)^{-3} = 0$ Assume $k \neq 0$ *hint: Do not expand the power*

34. $x = \underline{\hspace{2cm}}$ $\frac{25x}{\sqrt{1200^2 + x^2}} - 20 = 0$

35. $w = \underline{\hspace{2cm}}$ $-5.12Vw^{-2} + 10w = 0$ Assume $V > 0$

36. Simplify $\frac{2x^{2/3}(x^2 - 3) \cdot 2x - \frac{2}{3}x^{-1/3}(x^2 - 3)^2}{(x^2 - 3)^{3/2}}$

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

38. Solve the following quadratic functions by **completing the square:**

$$z^2 - 5z - 8 = 0$$

$$3w^2 - 2w - 15 = 0$$