1. Solve for t in: $2A_0 = A_0e^{t(.12)}$

2. Solve for t in: $2A_0 = A_0e^{t(.06)}$

3. Solve for t in: $2A_0 = A_0e^{t(.11)}$

4. Solve for t in: $2A_0 = A_0e^{t(.03)}$

5. Solve for t in: $4A_0 = A_0e^{t(.12)}$

6. Solve for t in: $6A_0 = A_0e^{t(.06)}$

7. Solve for t in: $10A_0 = A_0e^{t(.11)}$

8. Solve for t in: $7A_0 = A_0e^{t(.03)}$

9. Solve for t in: $\frac{1}{2}A_0 = A_0e^{t(-.12)}$

10. Solve for t in: $\frac{3}{5}A_0 = A_0e^{t(-.06)}$

11. Solve for t in: $\frac{3}{4}A_0 = A_0e^{t(-.03)}$

12. Solve for k in: $\frac{1}{2}A_0 = A_0e^{k\cdot 5}$

13. Solve for k in: $\frac{2}{3}A_0 = A_0e^{k\cdot 10}$

14. Solve for k in: $\frac{1}{3}A_0 = A_0e^{k\cdot 10}$

15. Solve for k in: $\frac{3}{2}A_0 = A_0e^{k\cdot 10}$

16. Solve for k in: $\frac{3}{2}A_0 = A_0e^{k\cdot 7}$

17. Solve for k in: $\frac{1}{10}A_0 = A_0e^{k\cdot 7}$

18. Solve
$$\log_5(x+1) = 2$$

19. Solve
$$\log_5(x+1) = -2$$

20. Solve
$$\ln(x+1) = 2$$

21. Solve
$$3^{2x+1} = 5$$

22. Solve
$$3^{5x+1} = 3^{x-1}$$

23. Solve
$$3^{5x+1} = 9^{x-1}$$

24. Solve
$$3 = 5e^{3x+4}$$

25. Solve
$$3 = 2e^{2x-4}$$

26. Solve
$$2 \cdot 3^{5x+1} = 9^{x-1}$$

27. Solve

$$2 \cdot 3^{5x+1} = 7 \cdot 9^{x-1}$$

28. Solve

$$\log_2 x - \log_2 3 - \log_2(x-2) = -1$$

29. Solve

$$\log_2 x = \log_2 3 + \log_2(x-2)$$

30. Solve (if possible)

$$\log_2 x - \log_4 3 - \log_4(x-2) = 2$$

31. Solve (if possible)

$$5^x = -1$$

32. Solve (if possible)

$$.25^x - 5 \cdot .5^x + 6 = 0$$

33. Solve (if possible)

$$16^x - 7 \cdot 4^x + 12 = 0$$

34. Solve (if possible)

$$16^{x-1} - 5^x = 0$$

MAIN IDEA to SOLVE EQS

Last section was important for many reasons. One of the reasons it is important to be well versed in all log properties is so that we can solve logarithmic and exponential equations. The following ideas should help to solve many of logarithmic and exponential equations.

USE DEF of LOGS

Solve

$$\log_3(x+5) = 2$$

Solutions

$$\begin{aligned} \log_3(x+5) &= 2 && \text{given} \\ 3^2 &= x+5 && \text{using DEF 'B'} \\ 9 &= x+5 && \text{alg} \\ 4 &= x && \text{alg} \end{aligned}$$

USE LOGS are ONE-to-ONE

Solve

$$log_3(x+5) = \log_3(2x+1)$$

Solutions

$$\begin{aligned} \log_3(x+5) &= \log_3(2x+1) && \text{given} \\ x+5 &= 2x+1 && \text{Logs R 1-1} \\ 4 &= x && \text{alg} \end{aligned}$$

USE EXPONENTIALs are ONE-to-ONE

Solve

$$3^{3x+1} = 3^{-x+4}$$

Solutions

$$\begin{aligned} 3^{3x+1} &= 3^{-x+4} && \text{given} \\ 3x+1 &= -x+4 && \text{Expo Functions are 1-1} \\ 4x &= 3 && \text{alg} \\ x &= 3/4 && \text{alg} \end{aligned}$$

USE LOG PROPERTIES

Solve

$$\log(x+1) - \log 2 - \log x = 2$$

Solutions

$$\begin{aligned}
\log(x+1) - \log 2 - \log x &= 2 && \text{given} \\
\log(x+1) - (\log 2 + \log x) &= 2 && \text{alg} \\
\log(x+1) - \log(2x) &= 2 && \text{LP=SL} \\
\log\left(\tfrac{x+1}{2x}\right) &= 2 && \text{LQ=DL} \\
10^2 &= \tfrac{x+1}{2x} && \text{DEF 'B'} \\
100 &= \tfrac{x+1}{2x} && \text{alg} \\
200x &= x+1 && \text{alg} \\
199x &= 1 && \text{alg} \\
x &= \tfrac{1}{199} && \text{alg}
\end{aligned}$$

SLAP a LOG on both sides

Solve

$$3^x = 2$$

Solutions

$$\begin{aligned}
3^x &= 2 && \text{given} \\
\log 3^x &= \log 2 && \text{SLAP a LOG} \\
x \log 3 &= \log 2 && \text{BID} \\
x &= \tfrac{\log 2}{\log 3} && \text{alg}
\end{aligned}$$

USE QUADRATIC METHODS

Solve

$$9^x - 5 \cdot 3^x + 6 = 0$$

Solutions

$9^x - 5\cdot 3^x + 6 = 0$	given
$(3^2)^x - 5\cdot 3^x + 6 = 0$	alg
$3^{2x} - 5\cdot 3^x + 6 = 0$	alg
$(3^x - 2)(3^x - 3) = 0$	factor as quadratic
$3^x - 2 = 0 \quad \& \quad 3^x - 3 = 0$	ZERO Fac THM
$3^x = 2 \quad \& \quad 3^x = 3$	alg
$3^x = 2 \quad \& \quad 3^x = 3^1$	note the 1st eq was solved above
$x = \frac{\log 2}{\log 3} \quad \& \quad x = 1$	expo functions are 1-1