

$$\begin{aligned} \textcircled{7} \log_6(3x^2-3x) &= 3 \\ 3x^2-3x &= 6^3 \\ 3x^2-3x-216 &= 0 \\ x^2-x-72 &= 0 \\ (x-9)(x+8) &= 0 \\ \boxed{x=9} \quad x &= \cancel{-8} \end{aligned}$$

$$\begin{aligned} \textcircled{8} (7^2)^{(5x+2)} &= (7^{-1})^{(11-x)} \\ 10x+4 &= x-11 \\ 9x &= -15 \\ x &= -\frac{15}{9} \\ \boxed{x &= -\frac{5}{3}} \end{aligned}$$

$$\begin{aligned} \textcircled{9} 3e^{4x} &= 24 \\ e^{4x} &= 8 \\ \text{LN } 8 &= 4x \\ \boxed{x &= \frac{\text{LN } 8}{4}} \end{aligned}$$

$$\begin{aligned} \textcircled{10} \left(\frac{2x}{2x-1} + \frac{1}{x} = \frac{1}{2x-1}\right)^{x(2x-1)} \\ 2x^2+2x-1 &= x \\ 2x^2+x-1 &= 0 \\ (2x+1)(x-1) &= 0 \\ \boxed{x = -\frac{1}{2}, x = 1} \end{aligned}$$

$$\begin{aligned} \textcircled{11} (x+5)(x+3) &= 2(x+3) \\ x+5 &= 2 \\ x &= -3 \\ \boxed{\text{NO SOLUTION}} \end{aligned}$$

$$\begin{aligned} \textcircled{12} P_q: \pm 1, 2, 3, 4, 6, 8, 12, 24 \\ -3 \mid 1 \quad 1 \quad -14 \quad -24 \\ \quad -3 \quad 6 \quad 24 \\ \quad \quad 1 \quad -2 \quad -8 \quad 0 \\ (x+3)(x^2-2x-8) &= 0 \\ (x+3)(x-4)(x+2) &= 0 \\ \boxed{x = -3, x = 4, x = -2} \end{aligned}$$

$$\begin{aligned} \textcircled{13} x &= \log_{1/3}(y-2) \\ \left(\frac{1}{3}\right)^x &= y-2 \\ y &= \left(\frac{1}{3}\right)^x + 2 \\ \boxed{f^{-1}(x) &= \left(\frac{1}{3}\right)^x + 2} \end{aligned}$$

$$\begin{aligned} \textcircled{14} x &= \left(\frac{1}{2}\right)^y - 3 \\ x+3 &= \left(\frac{1}{2}\right)^y \\ \log_{1/2}(x+3) &= -y \\ y &= -\log_{1/2}(x+3) \\ \boxed{f^{-1}(x) &= -\log_{1/2}(x+3)} \end{aligned}$$

$$\textcircled{15} \log_2 \frac{1}{2} = \boxed{-1}$$

$$\textcircled{16} \log_5 125 = \boxed{3}$$

$$\textcircled{17} \log_{1/2} 16 = \boxed{-4}$$

$$\textcircled{18} \log_2 8 = \boxed{3}$$

$$\begin{aligned} \textcircled{19} \text{LN } e + \log 10 \\ 1+1 \\ = \boxed{2} \end{aligned}$$

$$\begin{aligned} \textcircled{20} \log_8 16 &= \frac{4}{3} \\ 8^x &= 16 \\ 2^{3x} &= 2^4 \\ x &= \frac{4}{3} \end{aligned}$$

$$\begin{aligned} \textcircled{21} \frac{a}{5} \cdot \frac{10}{a-1} \\ = \boxed{\frac{2a}{a-1}} \end{aligned}$$

$$\begin{aligned} \textcircled{22} \frac{\frac{3}{2+x} + \frac{6}{2-x}}{\frac{5}{x+2} - \frac{1}{x-2}} \cdot \frac{(2+x)(2-x)}{(2+x)(2-x)} \\ = \frac{3(2-x) + 6(2+x)}{5(2-x) + 1(2+x)} = \frac{6-3x+12+6x}{10-5x+2+x} \\ = \frac{3x+18}{-4x+12} = \boxed{\frac{3(x+6)}{-4(x-3)}, x \neq \pm 2} \end{aligned}$$

$$\begin{aligned} \textcircled{23} \text{LN } 7 - \text{LN}(4x)^2 + \text{LN}(x)^3 \\ \text{LN } \frac{7}{16x^2} + \text{LN}(x)^3 \\ \text{LN } \frac{7x^3}{16x^2} \\ \boxed{\text{LN}\left(\frac{7x}{16}\right)} \end{aligned}$$

$$\begin{aligned} \textcircled{24} \log_7 49x^2 + \log_7(yz) \\ \log_7 49 + \log_7 x^2 + \log_7 y + \log_7 z \\ \boxed{2 + 2\log_7 x + \log_7 y + \log_7 z} \end{aligned}$$

$$\begin{aligned} \textcircled{25} A &= P(1 + \frac{r}{n})^{nt} \\ 4 &= (1 + \frac{.04}{12})^{12t} \\ \log 4 &= 12t \log(1 + \frac{.04}{12}) \\ t &= \frac{1}{12} \cdot \frac{\log 4}{\log(1 + \frac{.04}{12})} \\ t &\approx \boxed{34.715 \text{ YEARS}} \end{aligned}$$

$$\begin{aligned} \textcircled{26} A &= Pe^{-rt} \\ 50,000 &= 10,000e^{.03t} \\ 5 &= e^{.03t} \\ \text{LN } 5 &= .03t \\ t &= \frac{\text{LN } 5}{.03} \\ t &\approx \boxed{53.648 \text{ YEARS}} \end{aligned}$$

$$\begin{aligned} \textcircled{27} \frac{1}{2} &= e^{20r} \\ \text{LN}\left(\frac{1}{2}\right) &= 20r \\ \frac{1}{20} \text{LN}\left(\frac{1}{2}\right) &= r \\ -0.03466 &\approx r \\ \boxed{3.466\%} \end{aligned}$$

$$\begin{aligned} \textcircled{28} \text{DROPS: } S &= \frac{20}{1-(.6)} = 50 \text{ m} \\ \text{REBOUNDS: } S &= \frac{12}{1-.6} = 30 \text{ m} \end{aligned}$$

80 m

$$\begin{aligned} \textcircled{29} S_{15} &= \frac{927(1-1.03^{15})}{1-1.03} \\ \boxed{\$17,241.19} \end{aligned}$$

$$\begin{aligned} \textcircled{30} 600 + 450 + 337.5 + \dots \\ S &= \frac{600}{1-.75} = \boxed{\$2400} \end{aligned}$$

$$\begin{aligned} \textcircled{31} 3, 5, 7, \dots \\ S_7 &= \frac{7(3+15)}{2} \\ &= \boxed{63} \end{aligned}$$

$$\begin{aligned} a_n &= 2n+1 \\ a_7 &= 15 \end{aligned}$$

$$\begin{aligned} \textcircled{32} 10, 8, 6.4, \dots \\ S &= \frac{10}{1-.8} = \boxed{50ft} \end{aligned}$$