(7) $\log_6(3x^2-3x)=3$

$3x^2-3x=6^3$

$3x^2-3x-216=0$

$x^2-x-72=0$

$(x-9)(x+8)=0$

$\boxed{x=9}$ $x=\cancel{-8}$

(8) $(7^2)^{(5x+2)}=(7^{-1})^{(11-x)}$

$10x+4=x-11$

$9x=-15$

$x=-\frac{15}{9}$

$\boxed{x=-\frac{5}{3}}$

(9) $3e^{4x}=24$

$e^{4x}=8$

$\ln 8=4x$

$\boxed{x=\frac{\ln 8}{4}}$

(10) $\left(\frac{2x}{2x-1}+\frac{1}{x}=\frac{1}{2x-1}\right)\cdot x(2x-1)$

$2x^2+2x-1=x$

$2x^2+x-1=0$

$(2x+1)(x-1)=0$

$\boxed{x=-\frac{1}{2},\ x=1}$

(11) $(x+5)(x+3)=2(x+3)$

$x+5=2$

$x=-3$

NO SOLUTION

(12) $P/Q: \pm 1,2,3,4,6,8,12,24$

-3 | 1 1 −14 −24

| −3 6 24

1 −2 −8 | 0

$(x+3)(x^2-2x-8)=0$

$(x+3)(x-4)(x+2)=0$

$\boxed{x=-3,\ x=4,\ x=-2}$

(13) $x=\log_{1/3}(y-2)$

$(\frac{1}{3})^x=y-2$

$y=(\frac{1}{3})^x+2$

$\boxed{f^{-1}(x)=(\frac{1}{3})^x+2}$

(14) $x=(\frac{1}{2})^{-y}-3$

$x+3=(\frac{1}{2})^{-y}$

$\log_{1/2}(x+3)=-y$

$y=-\log_{1/2}(x+3)$

$\boxed{f^{-1}(x)=-\log_{1/2}(x+3)}$

(15) $\log_2 \frac{1}{2}=\boxed{-1}$ (16) $\log_5 125=\boxed{3}$ (17) $\log_{1/2} 16=\boxed{-4}$ (18) $\log_2 8=\boxed{3}$

(19) $\ln e+\log 10$

$1+1$

$=\boxed{2}$

(20) $\log_8 16=\boxed{4/3}$

$8^x=16$

$2^{3x}=2^4$

$x=4/3$

(21) $\frac{9}{5}\cdot\frac{10}{a-1}$

$=\boxed{\frac{2a}{a-1}}$

(22) $\frac{\frac{3}{2+x}+\frac{6}{2-x}}{\frac{5}{x+2}-\frac{1}{x-2}}\cdot\frac{(2+x)(2-x)}{(2+x)(2-x)}$

$=\frac{3(2-x)+6(2+x)}{5(2-x)+1(2+x)}=\frac{6-3x+12+6x}{10-5x+2+x}$

$=\frac{3x+18}{-4x+12}=\boxed{\frac{3(x+6)}{-4(x-3)},\ x\neq\pm 2}$

(23) $\ln 7-\ln(4x)^2+\ln(x)^3$

$\ln\frac{7}{16x^2}+\ln(x)^3$

$\ln\frac{7x^3}{16x^2}$

$\boxed{\ln\left(\frac{7x}{16}\right)}$

(24) $\log_7 49x^2+\log_7(yz)$

$\log_7 49+\log_7 x^2+\log_7 y+\log_7 z$

$\boxed{2+2\log_7 x+\log_7 y+\log_7 z}$

(25) $A=P(1+\frac{r}{n})^{nt}$

$4=(1+\frac{.04}{12})^{12t}$

$\log_{(1+\frac{.04}{12})}4=12t$

$t=\frac{1}{12}\cdot\frac{\log 4}{\log(1+\frac{.04}{12})}$

$t\approx\boxed{34.715\text{ YEARS}}$

(26) $A=Pe^{rt}$

$50{,}000=10{,}000e^{.03t}$

$5=e^{.03t}$

$\ln 5=.03t$

$t=\frac{\ln 5}{.03}$

$t\approx\boxed{53.648\text{ YEARS}}$

(27) $\frac{1}{2}=e^{20r}$

$\ln(\frac{1}{2})=20r$

$\frac{1}{20}\ln(\frac{1}{2})=r$

$-.03466\approx r$

$\boxed{3.466\%}$

(28) DROPS: $S=\frac{20}{1-(.6)}=50\text{m}$

REBOUNDS: $S=\frac{12}{1-.6}=30\text{m}$

$\boxed{80\text{m}}$

(29) $S_{15}=\frac{927(1-1.03^{15})}{1-1.03}$

$\boxed{\$17{,}241.19}$

(30) $600+450+337.5+\ldots$

$S=\frac{600}{1-.75}=\boxed{\$2400}$

(31) $3,5,7,\ldots$

$S_7=\frac{7(3+15)}{2}$

$=\boxed{63}$

$a_n=2n+1$

$a_7=15$

(32) $10,8,6.4,\ldots$

$S=\frac{10}{1-.8}=\boxed{50\text{ft}}$