Solutions

1.) a) $C = b^a$ b) $M = \frac{2}{5}^K$

2.) a) $x = \log_5 Y$ b) $x = \log_{\frac{4}{1052}} x$

3.) a) 7 b) -3 c) 0 d) -2

4.) a) $\log_2(7 \cdot 49) = 3$ b) $\log_3\left(\frac{54 \cdot 3}{2}\right) = 4$ c) $\log_3 \sqrt{3} = \frac{1}{2}$

5.) a) 2 b) 2

Part B

1.) a) $1 = \log_2\left(\frac{x+4}{x+8}\right)$ $x = -4$ b) $\log_2\left(\frac{30x}{5}\right) = \log_2 12$ $x = 2$

2.) ~~a) 3.8 b)~~ ~~a) 3.~~ a) 7.9 times stronger

3.) a) 3.8 b) 10^{-21}

4.) 26.5

5.) 33

Part C

1.) $\log_4(6x+4) = 6 + \log_4(x-1)$

$6 = \log_4\left(\frac{6x+4}{x-1}\right)$

$4^6 = \frac{6x+4}{x-1}$

$4069x - 4069 = 6x + 4$

$\frac{4063x}{4063} = \frac{4073}{4063}$

$x = 1.0025$

2.) $70 = 10 \log \frac{I}{10^{-12}}$

$7 = \log I - \log 10^{-12}$

$7 = \log I + 12$

$-5 = \log I$

$10^{-5} = I$

$I = 10^{-5}$

Therefore, the intensity of sound of the second car is

$0.000\ 02$

$x = 10 \log \frac{0.000\ 02}{10^{-12}}$

$x = \log 20\ 000\ 000$

$x = 73$ dB

3.) a) $C = P(1.038)^t$

b) $C = 400(1.038)^{10}$

$C = \$80.60$

c) $47.95 = P(1.038)^{20}$

$47.95 = P(1.45)$

$P = \$33.07$

Part D

1.) $y = a(k[\log x - d]) + c$

Vertically compressed by a factor of 5

$y = \frac{1}{5}(k[\log x - d]) + c$

Reflected in the Y-axis

$y = -\frac{1}{5}(k[\log x - d]) + c$

Horizontally stretched by factor 3

$y = -\frac{1}{5}(\frac{1}{3}[\log x - d]) + c$

Vertically translated 1 unit up

$y = -\frac{1}{5}(3[\log x - d]) + 1$

Translated so that the vertical asymptote is $x = -6$

$y = \frac{1}{5}(\frac{1}{3}[\log x + 6]) + 1$