

$$\log_b m + \log_b n = \log_b(mn)$$

$$\log_b m - \log_b n = \log_b\left(\frac{m}{n}\right)$$

$$\log_b m^p = p \log_b m$$

$$7. \log_6(x-2) + \log_6(x+3) = \log_6 14$$

$$\log_6(x^2 + x - 6) = \log_6 14$$

$$\begin{array}{r} x^2 + x - 6 \\ \hline -14 \end{array} = 14$$

$$x^2 + x - 20 = 0$$

$$x = \frac{-1 \pm \sqrt{1^2 - 4(1)(-20)}}{2(1)}$$

$$x = \frac{-1 \pm \sqrt{81}}{2} = \frac{-1 \pm 9}{2} = \frac{-1 + 9}{2}, \frac{-1 - 9}{2}$$

$$x = 4, \cancel{-5}$$

8. $\log_6 x - \log_6(x-5) = \log_6 2$

$$\log_6\left(\frac{x}{x-5}\right) = \log_6 2$$

$$\cancel{x} \frac{x}{x-5} = 2^{(x-5)}$$

$$x = 2x - 10$$

$$\begin{aligned} -x &= -10 \\ x &= 10 \end{aligned}$$

9. $\log_2 4x - \log_2 5 = 6$

$$\log_2 \frac{4x}{5} = 6$$

\swarrow change to exp. form $\log_b x = y$
 $b^y = x$

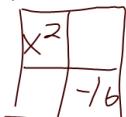
$$(5) 2^6 = \frac{4x}{5} (5)$$

$$\begin{aligned} 320 &= 4x \\ 80 &= x \end{aligned}$$

10. $\log_4 x + \log_4(x-6) = 2$

$$\log_4(x^2 - 6x) = 2$$

$$\begin{aligned} 4^2 &= x^2 - 6x \\ -16 & \\ 0 &= x^2 - 6x - 16 \end{aligned}$$



$$x = \frac{6 \pm \sqrt{(-6)^2 - 4(1)(-16)}}{2(1)}$$

$$\begin{aligned} 0 &= (x-8)(x+2) \\ x-8 &= 0 & x+2 &= 0 \\ x &= 8 & x &= -2 \end{aligned}$$

$$\begin{aligned} &= \frac{6 \pm \sqrt{100}}{2} = \frac{6 \pm 10}{2} = \frac{16}{2} > \frac{-4}{2} \\ &\quad (x = 8), \cancel{x = -2} \end{aligned}$$