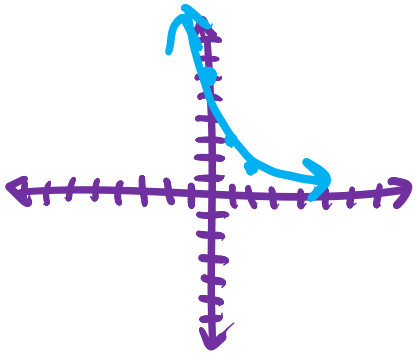
9.1–9.3 HW Worksheet

① $y = 6\left(\frac{1}{2}\right)^x$

D: all real #s

R: all POSITIVE real #s



② $y = 0.3\left(\frac{8}{5}\right)^x$ growth

~~③~~ $(0,-5)(-3,-40)$

⑥ $10^{x+3} > 100^{x-1}$

$10^{x+3} > 10^{2(x-1)}$

$x+3 > 2x-2$

$-1x > -5$

$\boxed{x < 5}$

⑦ $5^{-4} = \frac{1}{625}$ $\boxed{\log_5 \frac{1}{625} = -4}$

⑧ $\log_6 6^8$ $\boxed{8}$

~~⑨~~ $\log_8 128$

⑩ $\log_{64} x = \frac{2}{3}$ $64^{\frac{2}{3}} = x$ $\boxed{x = 16}$

⑪ $\log_4(2x+5) \le \log_4(3x-2)$

$2x + 5 \le 3x - 2$

$-1x \le -7$

$\boxed{x \ge 7}$

$\log_5 2 \approx x$, $\log_5 3 \approx y$

(12) $\log_5 18 \quad \log_5(3^2 \cdot 2)$

$2 \cdot \log_5 3 + \log_5 2$

$2(\ y\ ) + x$

$\boxed{2y + x}$

(13) $\log_5 \frac{5}{2}$

$\log_5 5 - \log_5 2$

$\boxed{1 - x}$

(14) $\log_5 n = \frac{1}{3} \cdot \log_5 64 + \frac{1}{2} \cdot \log_5 49$

$\log_5 n = \log_5 64^{\frac{1}{3}} + \log_5 49^{\frac{1}{2}}$

$\log_5 n = \log_5 (4 \cdot 7)$

$\boxed{n = 28}$

(15) $\log_6(5-2a) - \log_6(3a) = 1$

$\log_6\left(\frac{5-2a}{3a}\right) = 1$

$3a \cdot 6^1 = \frac{5-2a}{3a} \cdot 3a$

$18a = 5 - 2a$

$20a = 5$

$\boxed{a = .25}$

(16) $\log_3(x-3) + \log_3(x+2) = \log_3 6$

FOIL $(x-3)(x+2) = 6$

$x^2 - x - 6 = 6$

$x^2 - x - 12 = 0$

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

$x = 4$ and $\cancel{-3}$

$\boxed{x = 4}$