

Pre-calc Final Review ~~work~~ worksheet 2.

$$\textcircled{1} \quad 4e^{2x} - 10 = 2$$

$$4e^{2x} = 12$$

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

$$2x \ln(e) = \ln(3)$$

$$2x = \ln(3)$$

$$x = \frac{\ln(3)}{2} \approx 0.549$$

$$\textcircled{2} \quad 3^{5x+1} = 5$$

$$(5x+1) \ln(3) = \ln(5)$$

$$5x+1 = \frac{\ln(5)}{\ln(3)}$$

$$x = \left(\frac{\ln(5)}{\ln(3)} - 1 \right) \cdot \frac{1}{5}$$

$$x \approx 0.093$$

$$\textcircled{3} \quad \ln(3x+7) = \ln(24x)$$

$$3x+7 = 24x$$

$$7 = 21x$$

$$x = \frac{1}{3}$$

$$\textcircled{4} \quad \log_5(3x+7) + \log_5(x-2) = 1$$

$$\log_5((3x+7)(x-2)) = 1$$

$$(3x+7)(x-2) = 10$$

$$3x^2 - 6x + 7x - 14 = 10$$

$$3x^2 + x - 24 = 0$$

$$3x^2 + 9x - 8x - 24 = 0$$

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

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

$$\boxed{x = \frac{8}{3}} \quad x = -3 \text{ reject.}$$

$$\textcircled{6} \quad \frac{\log_5(10)}{\log_5(5)} \approx 1.43$$

$$\textcircled{7} \quad 2 \log_5 x = \log_5 y + 3 \log_5 z$$

$$= \log_5 x^2 - \log_5 y + \log_5 z^3$$

$$= \log_5 \left(\frac{x^2 z^3}{y} \right)$$

$$\textcircled{8} \quad \log_5 \left(\frac{y^2 \sqrt{x}}{z^3} \right) = 2 \log_5 y + \frac{1}{2} \log_5 x - 3 \log_5 z$$

$$\textcircled{9} \quad A = P \left(1 + \frac{r}{n} \right)^{nt}$$

$$\textcircled{a} \quad A = 400 \left(1 + \frac{.035}{12} \right)^{(12)(15)}$$

$$\approx \$675.67$$

$$\textcircled{b} \quad A = 400 \left(1 + \frac{.035}{12} \right)^{(4)(15)}$$

$$\approx \$674.64$$

$$\textcircled{10} \quad A = Pe^{rt}$$

$$1250 = 100 e^{.07t}$$

$$12.5 = e^{.07t}$$

$$\ln(12.5) = .07t$$

$$t = \frac{\ln(12.5)}{.07} \approx 36 \text{ years}$$

$$\textcircled{5} \quad \log_{78}(20) = \frac{\log 20}{\log 78} \approx 1.44$$

$$\textcircled{1} a_n = a_p + d(n-p)$$

$$a_n = 26 + 13(n-12)$$

$$= 26 + 13n - 156$$

$$\boxed{a_n = 13n - 130}$$

$$\textcircled{2} a_{10} = 50, a_{15} = 75$$

n	a _n
10	50
15	75

$$d = \frac{75-50}{15-10} = \frac{25}{5} = 5$$

$$a_n = a_p + d(n-p)$$

$$= 50 + 5(n-10)$$

$$= 50 + 5n - 50$$

$$\boxed{a_n = 5n}$$

$$\textcircled{3} \sum_{i=1}^{60} 4i + 75 = \frac{60}{2} (79 + 315)$$

$$= 11,820$$

$$\textcircled{14} \sum_{i=3}^{500} 3i - 1 = \frac{498}{2} (8 + 1499)$$

$$= 375,243$$

$$\textcircled{15} a_n = 3(2)^{n-1}$$

$$a_1 = 3$$

$$a_2 = 3(2) = 6$$

$$a_3 = 3(2)^2 = 12$$

$$a_4 = 3(2)^3 = 24$$

$$\textcircled{16} \sum_{i=1}^5 3(4)^i = 12 \left(\frac{1-4^6}{1-4} \right)$$

$$= 4092$$

$$a_1 = 12$$

$$\textcircled{17} \sum_{i=1}^{\infty} 2 \left(\frac{1}{5} \right)^i = \frac{2}{5} \left(\frac{1}{1 - \frac{1}{5}} \right) =$$

$$r = \frac{1}{5}$$

$$a_1 = \frac{2}{5} = \frac{2}{5} \left(\frac{5}{4} \right) = \frac{1}{2}$$

$$\textcircled{18} y = \frac{8x^5 - 3x^2}{5x^8 + 3x^3}$$

H-asymptote: $y = 0$

$$\textcircled{19} y = \sqrt{4-x}$$

$$4-x \geq 0$$

$$\boxed{4 \geq x}$$