

1.5 revised 9/18/2023

$$16) \frac{b^9}{b^3} = \underline{b^6} \quad | \quad 18) (m^2 n)^4 = (m^2 n)(m^2 n)(m^2 n) = \underline{m^6 n^3}$$

$$20) (2xy^2)^3 = (2xy^2)(2xy^2)(2xy^2) = \underline{8x^3 y^6}$$

$$22) 7^{\frac{5}{2}} = \underline{(\sqrt{7})^5} = \sqrt{7^5}$$

$$24) w^{\frac{3}{4}} = \underline{(\sqrt[4]{w})^3} = \sqrt[4]{w^3}$$

$$26) 8^{\frac{t}{3}} = (\sqrt[3]{8})^t = 2^t \quad \underline{\text{true}}$$

$$30) 12e^{0.2t} \approx (2 \cdot (1.2214))^t$$

$$28) \frac{1}{e^{\frac{x}{2}}} = \frac{1}{(\sqrt{e})^x} = \frac{1}{(\sqrt{e})^x} = \left(\frac{1}{\sqrt{e}}\right)^x \quad \underline{\text{true}}$$

True

36) start with 500 bacteria and doubles every half hour  
let  $x$  be units of half hour.

a) 3 hours  $\Rightarrow x=6$   $B(x) = (500)2^x$

$$B(6) = (500)2^6 = (500)(2)(2)(2)(2)(2)(2) = (1000)(2)^5 = (1000)(32) = \underline{32000 \text{ bacteria}}$$

revised 9/18/2023  
b)  $t$  hours  $\Rightarrow x=2t$   $\underline{B(t) = (500)2^{(2t)}}$

c) 40 minutes  $\Rightarrow x = \frac{4}{3}$  "because 30 min + 10 min ( $\frac{1}{3}$  of 30 minutes)"

$$B\left(\frac{4}{3}\right) = (500)2^{\left(\frac{4}{3}\right)} = (500)(\sqrt[3]{2})^4 = (500)(2)\sqrt[3]{2} = \underline{(1000)\sqrt[3]{2} \text{ bacteria}}$$

$$38) f(x) = Ca^x \quad (0, 2), \quad \left(2, \frac{2}{9}\right) \rightarrow f(2) = \frac{2}{9} = Ca^{(2)}$$

$$f(0) = 2 = Ca^{(0)} = C$$

$$C = 2$$

$$\frac{2}{9} = (2)a^2$$

$$\frac{1}{9} = a^2$$

$$\left(\frac{1}{3}\right)^2 = a^2 \Rightarrow \frac{1}{3} = a$$

$$f(x) = 2\left(\frac{1}{3}\right)^x$$