

Quiz 2
(20 points total)

1. Write each number in scientific notation and then multiply. Write your final answer in scientific notation.

$$5430000 * 200000 =$$

$$5430000 = 5.43 \cdot 10^6 \text{ and } 200000 = 2 \cdot 10^5$$

$$\begin{aligned}(5.43 \cdot 10^6)(2 \cdot 10^5) &= (5.43 \cdot 2)(10^6 \cdot 10^5) \\ &= 10.86 \cdot 10^{11} \\ &= 1.086 \cdot 10^{12}\end{aligned}$$

2. Solve for x .

a. $5 * 10^{x+1} = 5000$

$$\begin{aligned}10^{x+1} &= 1000 && \text{(divide both sides by 5)} \\ \log(10^{x+1}) &= \log(1000) && \text{(take log of both sides)} \\ x + 1 &= 3 && \text{(log and 10 cancel)} \\ x &= 2\end{aligned}$$

b. $2\log(2x + 50) = 4$

$$\begin{aligned}\log(2x + 50) &= 2 && \text{(divide both sides by 2)} \\ 10^{\log(2x+50)} &= 10^2 && (10^{LHS} = 10^{RHS}) \\ 2x + 50 &= 100 && \text{(10 and log cancel)} \\ 2x &= 50 \\ x &= 25\end{aligned}$$

3. Write in simplest terms. Your answer should not contain negative exponents or radicals.

a. $\left(\frac{-2x^3y^4}{x^2y}\right)^2$

$$\begin{aligned}(-2xy^3)^2 &\text{(cancel like terms)} \\ (-2)^2x^2(y^3)^2 &\text{(distribute 2)} \\ 4x^2y^6 &\text{(power to a power means multiply the powers)}\end{aligned}$$

b. $\frac{a^{-3}bc^{-4}}{(ab^{-3})^{-2}c}$

$$\begin{aligned}\frac{a^{-3}bc^{-4}}{a^{-2}(b^{-3})^{-2}c} &\text{(distribute the 2)} \\ \frac{a^{-3}bc^{-4}}{a^{-2}b^6c} &\text{(power to a power means multiply the powers)} \\ \frac{a^2b}{a^3b^6c^5} &\text{(make all powers positive)} \\ \frac{a^2b}{a^3b^6c^5} &\text{(combine the c's by adding powers)} \\ \frac{1}{ab^5c^5} &\text{(cancel like terms)}\end{aligned}$$

c. $\sqrt{\frac{9x^2y^4}{16x^3y^3}}$

$$\begin{aligned} & \sqrt{\frac{9y}{16x}} \text{ (cancel like terms)} \\ & \sqrt{\frac{9}{16}} \sqrt{\frac{y}{x}} \text{ (break apart square root)} \\ & \frac{\sqrt{9}}{\sqrt{16}} \sqrt{\frac{y}{x}} \text{ (distribute square root)} \\ & \frac{3}{4} \sqrt{\frac{y}{x}} \end{aligned}$$