Rewrite using a single power.

a) $3^2 \cdot 3^4$ b) $(3^2)^4$ c) $\frac{3^4}{3^2}$ d) $\frac{3^2}{3^4}$

using def. of exponents → $(3\cdot3)(3\cdot3\cdot3\cdot3)$ 3^6 | $3^2\cdot3^2\cdot3^2\cdot3^2$ 3^8 | $\frac{3\cdot3\cdot\cancel{3}\cdot\cancel{3}}{\cancel{3}\cdot\cancel{3}}$ 3^2 | $\frac{\cancel{3}\cdot\cancel{3}}{\cancel{3}\cdot\cancel{3}\cdot3\cdot3}$ $\frac{1}{3^2}$ or 3^{-2}

using properties → 3^{2+4} 3^6 | $3^{2\cdot4}$ 3^8 | 3^{4-2} 3^2 | 3^{2-4} 3^{-2}

e) $(x^2)^3$ f) $x^2\cdot x^3$ g) $\frac{x^3}{x^2}$ h) $\frac{x^2}{x^3}$

using def of exponents → $x^2\cdot x^2\cdot x^2$ $(x\cdot x)(x\cdot x)(x\cdot x)$ x^6 | $(x\cdot x)(x\cdot x\cdot x)$ x^5 | $\frac{x\cdot x\cdot x}{x\cdot x}$ x | $\frac{x\cdot x}{x\cdot x\cdot x}$ $\frac{1}{x}$

using properties → $x^{2\cdot3}$ x^6 | x^{2+3} x^5 | x^{3-2} x | x^{2-3} x^{-1}

Let's take it up a notch! (or two ☺)

i) Is $2\cdot3^4 = 6^4$? False
Justify.

↳ using order of operations (PEMDAS), I have to do exponents 1st so $3^4 = 81$ then multiply 81 by 2 = 162 ...

$6^4 = 6\cdot6\cdot6\cdot6 = 1{,}296$

$2\cdot3^4 \neq 6^4$

* Be careful * ☺

j) $\left(\frac{8a^3b^6}{16b^8a}\right)^3$

* REDUCE 1st when possible *

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

$\frac{a^6}{2^3b^6}$

$\frac{a^6}{8b^6}$ ← nice ☺

Exponent Rules :

① Product of Powers: $a^m \cdot a^n = a^{m+n}$

② Power of a Power: $(a^m)^n = a^{m \cdot n}$

③ Power of a Product: $(a \cdot b)^n = a^n \cdot b^n$

④ Quotient of Powers: $\frac{a^m}{a^n} = a^{m-n}$

⑤ Power of a Quotient: $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$

10.2 Express your answer in Scientific Notation.

$\frac{143,000,000}{12,700,000}$ $\frac{1.43 \times 10^8}{1.27 \times 10^7} \rightarrow \frac{1.43}{1.27} \times \frac{10^8}{10^7} \rightarrow 1.13 \times 10^1$

$\frac{1.43 \times 10^3}{1.27 \times 10^2}$

If 11.3×10^1 or 1.13×10^2