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Show all your work for full credit. Unsupported answers = reduced points. Clearly identify your answers.

1. Simplify the following expressions. Write answers without negative exponents.

a) $a^3 c^{-6} \left(\frac{a^2 b^{-3}}{c^2} \right)^{-2}$

b) $\frac{(-2 x^{1/3} y^{-3/2})^{-2}}{(x^{-4} y^{1/2})^{2/3}}$

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2. Simplify the expression. Assume the letters represent any real number.

$$\sqrt[4]{81 x^4 y^{-8} z^{12}}$$

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3. Given $M = 3.056 \times 10^{-12}$, $H = 2.45 \times 10^{15}$, and $K = 6.022 \times 10^{23}$, evaluate $\frac{K^2}{MH}$. Be sure to use the appropriate significant digits.

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4. Completely factor the expression:

$$4(3x+4)^3(3)(x-2)^6 + (3x+4)^4(6)(x-2)^5$$

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5. Simplify the expression by factoring:

$$\frac{3 \cdot 6x^3 \cdot (2x+5)^4 - 6x^3 \cdot 4 \cdot (2x+5)^3 \cdot 2}{((2x+5)^4)^2}$$

[/3]

6. Simplify the expression:

$$\frac{x}{x^2-x-6} - \frac{1}{x+2} + \frac{2}{x-3}$$

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