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Tutorial 3

Question 1

a) $4^8 \times 4^3$

$= 4^{8+3}$

$= 4^{11}$ ✓

b) $6^4 \div 6^{-6}$

$= 6^{4-(-6)}$

$= 6^{10}$ ✓

c) $(8q)^{-3}$

$= 8q^{x(-3)}$

$= 8^{-27}$ ✓

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Question 2.

a) $\frac{q(x^2)^2}{3xy^2} = \frac{qx^4}{3xy^2}$

$= \frac{q^3}{3_1} \frac{x^4}{x} \frac{1}{y^2}$

$= 3x^{4-1} y^{-2}$

$= 3x^3 y^{-2}$

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

$= \frac{3x^3}{y^2}$ ✓

b) $\frac{a \times (ab^4)^2}{(a^2 \times b)^3}$

$= \frac{a \times a^2 b^8}{a^6 \times b^3}$

$= \frac{a^{1+2} b^8}{a^6 b^3}$

$= \frac{a^3 b^8}{a^6 b^3}$

$= a^{3-6} b^{8-3}$

$= a^{-3} b^5$

$= \frac{1}{a^3} b^5$

$= \frac{b^5}{a^3}$ ✓

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

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

$= \frac{a^{-2}}{b^3} \div \frac{1}{\frac{a^2}{b^4}}$

$= \frac{a^{-2}}{b^3} \div \frac{b^4}{a^2}$

$= \frac{a^{-2}}{b^3} \times \frac{a^2}{b^4}$

$= \frac{a^{-2} \times a^2}{b^3 \times b^4}$

$= \frac{a^{-2+2}}{b^{3+4}}$

$= \frac{a^0}{b^7}$

$= \frac{1}{b^7}$

3

Question 3

a) $2^{7x} \cdot 1 = 25 8^x$

$x^{7x} \cdot x^3 = x^{8x}$

$7x + 3 = 8x$

$7x - 8x + 3 = 8x - 8x$

$-x + 3 = 0$

$-x + 3 - 3 = 0 - 3$

$= x = -3$

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

$x = 3$

2

b) $\left(\frac{1}{36}\right)^{3-x} \left(\frac{1}{6}\right)^x = 216$

$\left(\frac{1}{6^2}\right)^{3-x} \left(\frac{1}{6}\right)^x = 6^3$

$(6^{-2})^{3-x} (6^{-1}) = 6^3$

$6^{-6+2x} \, 6^{-x} = 6^3$

$6^{-6+2x-x} = 6^3$

$-6 + 2x - x = 3$

$-6 + x = 3$

$-6 + 6 + x = 3 + 6$

$x = 9$

2

4

3