

Instructions: Show all work. Use exact answers unless specifically asked to round. Reduce as much as possible. Be sure to answer all parts of each question.

1. Perform the indicated operations and simplify.

a. $5x^0 - 5^0$

$$5(1) - 1 = 5 - 1 = 4$$

b. $(3x - 4)(5x + 11)$

$$15x^2 + 33x - 20x - 44 = 15x^2 + 13x - 44$$

c. $\left(\frac{4a^3b^5}{3a^{-4}b}\right)^{-3} \left(\frac{9ab^7}{a^{-5}b^6}\right) = \left(\frac{3a^{-4}b}{4a^3b^5}\right)^3 \left(\frac{9ab^7}{a^{-5}b^6}\right) = \left(\frac{27a^{-12}b^3}{64a^9b^{15}}\right) \left(\frac{9ab^7}{a^{-5}b^6}\right)$

$$= \left(\frac{243a^{-11}b^{10}}{64a^4b^{21}}\right) = \frac{243}{64a^{15}b^{11}}$$

d. $(3b - g)^2$

$$9b^2 - 6bg + g^2$$

e. $(r - 1)(r + 4)(r - 4)$

$$(r - 1)(r^2 - 16) = r^3 - 16r - r^2 + 16$$

$$= r^3 - r^2 - 16r + 16$$

2. Simplify the expression and write the final answer in scientific notation.

a. $0.0000004 \times \frac{.0001}{0.00000005}$

$$8 \times 10^{-4}$$

b. $(3 \times 10^7)^2 \times 5 \times 10^{-9}$

$$4.5 \times 10^6$$