March 24, 2024

Algebraic expression and exponents:

$$a^0 = 1$$

$$a^m \cdot a^n = a^{m+n}$$

$$a^m \div a^n = \frac{a^m}{a^n} = a^{m-n}$$

$$(ab)^n = a^n \cdot b^n$$

$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$$

$$a^n = \frac{1}{a^{-n}}$$

$$(a^m)^n = a^{m \cdot n}$$

$$(a \pm b)^2 = a^2 \pm 2ab + b^2$$

$$(a + b)(a - b) = a^2 - b^2$$

And *factorizing*:

$$a(b + c) = ab + ac$$

MATH 6 HOMEWORK 19

March 24, 2024

1. Simplify:

   (a) $\left(\dfrac{5a^2b^5}{4a^3b^3}\right)^3 =$

   (b) $\dfrac{(-ab)^7}{(ab)^3} =$

   (c) $\left(\dfrac{3a^5b^2}{21ab}\right)^2 \cdot \dfrac{7^4}{a^{16}b^2} =$

2. Simplify the following and show the answer in the exponent form.

   a) $\dfrac{42^2}{6^2} =$

   b) $\dfrac{6^5 \cdot 2^4}{3^5 \cdot 2^2} =$

   c) $\dfrac{3^{-5} \cdot 2^7}{3^{-3} \cdot 2^4} =$

3. Add fractions, simplify:

   (a) $\dfrac{1}{a} + \dfrac{1}{b} =$

   (b) $\dfrac{1}{x-1} - \dfrac{2}{x+1} =$

   (c) $b - \dfrac{ab}{a-b} =$

4. Open parenthesis, simplify:

   (a) $\left(3a + \dfrac{1}{3a}\right)^2 =$

   (b) $(3x - 7y)^2 =$

   (c) $(3x + 1)(3x - 1) =$

5. Factorize (i.e., write as a product, opposite to 4.) the following expressions:

   a. $ac + ab$

   b. $x^2 + 3x^3$

   c. $x^2(x + 4) + 5(x + 4)$

   d. $a^2 + 4ab + 4b^2$

   e. $a^2 - 2a + 1$