

Math 0302, Practice Test 4: Properties of Exponents & Polynomials

Instructions: Simplify the following expressions. Write all answers with positive exponents only.

#1 $x^{-4} \cdot x^{19}$

#2 $(p^7)^4$

#3 $\frac{x^4 y^5 z^2}{x^3 y^2 z^4}$

#4 $(p^{-1} q^3)^6$

Instructions: Perform the following operations as indicated.

#5 Subtract: $(9w^2 - 19w + 4) - (4w^2 - 19w + 3)$

#6 Multiply: $(x + 7)(x - 8)$

#7 Multiply: $(x + 12)(x - 12)$

#8 Multiply: $(4x + 5)^2$

#9 Divide: $\frac{44x^6 - 11x^2 + 2x}{11x^2}$

#10 Divide: $\frac{2x^2 + 9x + 5}{x - 3}$

SOLUTIONS

Instructions: Simplify the following expressions. Write all answers with positive exponents only.

$$\#1 \quad x^{-4} \cdot x^{19} = x^{-4+19} = x^{15}$$

$$\#2 \quad (p^7)^4 = p^{7 \times 4} = p^{28}$$

$$\#3 \quad \frac{x^4 y^5 z^2}{x^3 y^2 z^4} = \frac{x^{4-3} y^{5-2}}{z^{4-2}} = \frac{xy^3}{z^2}$$

$$\#4 \quad (p^{-1} q^3)^6 = p^{-1 \times 6} q^{3 \times 6} = p^{-6} q^{18} = \frac{1}{p^6} q^{18} = \frac{q^{18}}{p^6}$$

Instructions: Perform the following operations as indicated.

#5 Subtract: $(9w^2 - 19w + 4) - (4w^2 - 19w + 3)$ *To subtract, first distribute the negative, changing the signs of each term in the second polynomial. Then, add like terms.*

$$9w^2 - 19w + 4 - 4w^2 + 19w - 3$$

$$9w^2 - 4w^2 - 19w + 19w + 4 - 3$$

$$5w^2 + 1$$

#6 Multiply: $(x+7)(x-8)$

Remember FOIL

$$x^2 - 8x + 7x - 56$$

$$x^2 - x - 56$$

#7 Multiply: $(x+12)(x-12)$

$$(x)^2 - (12)^2$$

$$x^2 - 144$$

Remember

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

#8 Multiply: $(4x+5)^2$

$$(4x)^2 + 2 \cdot 4x \cdot 5 + (5)^2$$

Remember

$$(a+b)^2 = (a+b)(a+b) \quad 16x^2 + 40x + 25$$

Or

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

#9 Divide: $\frac{44x^6 - 11x^2 + 2x}{11x^2}$

$$\frac{44x^6}{11x^2} - \frac{11x^2}{11x^2} + \frac{2x}{11x^2}$$

#10 Divide: $\frac{2x^2 + 9x + 5}{x-3} = 2x + 15 + \frac{50}{x-3}$

$$4x^4 - 1 + \frac{2}{11x}$$

$$\begin{array}{r} 2x+15 \\ x-3 \overline{) 2x^2+9x+5} \\ \underline{-(2x^2-6x)} \\ 15x+5 \\ \underline{-(15x-45)} \\ 50 \end{array}$$