

Exponent Rules - Part 1 Practice

Combining Like Terms

Simplify each expression.

$$1) (2 + 7m^3) - (1 + 3m^3)$$

$$2 + 7m^3 - 1 - 3m^3$$

$$(7m^3 - 3m^3) + (2 - 1)$$

$$4m^3 + 1$$

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

$$(3x^4 + 1x^4) + (5x^2 + 3x^2)$$

$$4x^4 + 8x^2$$

$$3) (b^3 - b - 8) - (7b^3 + 7 + 3b)$$

$$b^3 - b - 8 - 7b^3 - 7 - 3b$$

$$(b^3 - 7b^3) + (-b - 3b) + (-8 - 7)$$

$$-6b^3 - 4b - 15$$

$$4) (6 - a + 3a^2) + (2 + a^2 - 8a^3)$$

$$-8a^3 + (3a^2 + 1a^2) - a + (6 + 2)$$

$$-8a^3 + 4a^2 - a + 8$$

$$5) (4r^2 - 7r^3 + 4r^4) + (2r^2 + 4r^4 - 6r^3)$$

$$(4r^4 + 4r^4) + (-7r^3 - 6r^3) + (4r^2 + 2r^2)$$

$$8r^4 - 13r^3 + 6r^2$$

$$6) (2r^4 - 7r^2 + r^3) - (8 + 6r^2 + 6r^3)$$

$$2r^4 - 7r^2 + r^3 - 8 - 6r^2 - 6r^3$$

$$2r^4 + (r^3 - 6r^3) + (-7r^2 - 6r^2) - 8$$

$$2r^4 - 5r^3 - 13r^2 - 8$$

The Product Rule

Simplify. Your answer should contain only positive exponents.

$$7) 2^1 \cdot 2^2$$

$$2^{1+2} = 2^3$$

$$= 8$$

$$8) (-3)^3 \cdot (-3)^4$$

$$(-3)^{3+4} = (-3)^7$$

↑ Why do you need these?

$$9) 2y^3 \cdot 3yx^3$$

$$(2 \cdot 3)(x^3)(y^3 \cdot y^1)$$

$$6x^3y^4$$

$$10) uv^4 \cdot 4uv^3$$

$$4(u^1 \cdot u^1)(v^4 \cdot v^3)$$

$$4u^2v^7$$

$$11) -4x^3y^2 \cdot y^4$$

$$-4x^3(y^2 \cdot y^4)$$

$$-4x^3y^6$$

$$12) -4mn \cdot -3nm^3$$

$$(-4)(-3)(m^1 \cdot m^3)(n^1 \cdot n^1)$$

$$12m^4n^2$$

$$13) -3x^{-1}y^3 \cdot -\frac{1}{x^4}$$

$$(-3 \cdot -1)(x^{-1} \cdot x^{-4})(y^3)$$

$$3x^3y^3$$

$$14) 4a^2b^4 \cdot -3a^2b^{-1} \cdot 3b^{-3}$$

$$(4 \cdot -3 \cdot 3)(a^2 \cdot a^2)(b^4 \cdot b^{-1} \cdot b^{-3})$$

$$-36a^4b^0$$

$$-36a^4$$

The Quotient Rule

Simplify. Your answer should contain only positive exponents.

$$15) \frac{2^2}{4} = \frac{4}{4}$$

$$1$$

$$16) \frac{3^8 \cdot 3^3}{3^3} = 3^3$$

$$= 27$$

$$17) \frac{3m^3n^3}{2m^4n^3}$$

$$\frac{3}{2} m^{3-4} n^{3-3}$$

$$\frac{3}{2m}$$

$$18) \frac{4x^4y^3}{3x^3y^2}$$

$$\frac{4}{3} x^{4-3} y^{3-2}$$

$$\frac{4}{3} xy$$

$$19) \frac{n^4}{3m^4n^2}$$

$$\frac{1}{3m^4} n^{4-2}$$

$$\frac{n^2}{3m^4}$$

$$20) \frac{u^3v^2}{2u^1}$$

$$\frac{1}{2} u^{3-1} v^2$$

$$\frac{1}{2} u^2v^2$$

$$21) \frac{-xy^3}{-2xy^3}$$

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

$$\frac{1}{2}$$

$$22) \frac{-y^4}{-4x^4y^3}$$

$$\frac{+1}{+4x^4} y^{4-3}$$

$$\frac{y}{4x^4}$$