

April 8 (Wed) is the Unit 3 test!

April 7 MPM2D Park

Unit 4 : Exponents:

Reviewing Exponent Laws

- $A^m \times A^n = A^{m+n}$ (Multiplication Law)
- $(A^m)^n = A^{mn}$ (Power Law)
- $\left(\frac{A}{B}\right)^m = \frac{A^m}{B^m}$ (Power of Quotient Law)
- If $a \neq 0$, $a^{-m} = \frac{1}{a^m}$ and $\frac{1}{a^{-m}} = a^m$ (negative exponent property)
- $A^m \div A^n = A^{m-n}$ (Division Law)
- $(AB)^m = A^m B^m$ (Power of a Product Law)
- If $a \neq 0$, $A^0 = 1$ (Zero Exponent Property)

or index

power

or exponent

$$\begin{array}{l} \downarrow \\ 8^2 = 8 \times 8 = 64 \\ \uparrow \\ \text{Base} \end{array}$$

$$2^3 = 2 \times 2 \times 2 = 8$$

$$0^0 = \text{undefined}$$

Exponent Rules Review

1. Write as a single power, then evaluate.

- $3^2 \times 3^3$
- $(-2)^3(-2)^2$
- $(5)^4(5)^3$
- $(3.2)^2(3.2)^2$
- $((y)^2)^3$
- $(3)^4 \div (3)^2$
- $((-2)^2)^5$
- $(-4.5)^3 \div (-4.5)$
- $\frac{3^5}{3^3}$
- $\frac{(-7)^3}{(-7)^2}$
- $-(1.2)^2$
- $(-0.6)^2$

2. Multiply.

- $(3a)(-2z^3)$
- $(-2r^2)(8s)$
- $-4c(5de)$
- $2xy \times 3xy = 6x^{1+1}y^{1+1} = 6x^2y^2$
- $(-3abm)(2bm)$
- $-u(5ut^2)$
- $(2a^2b^3c)(-3bc^2d)$
- $-5r^2st \times 2rs^2t^2$
- $(5x)(4y)(-3z)$
- $-2d(3d)(3e)$
- $(-k^2mn^2)(4mn)(-2kn^2)$
 $= 8k^{2+1} \cdot m^{1+1} \cdot n^{2+1+2}$
 $= 8k^3m^2n^5$

3. Simplify.

- $(3ty)^2$
- $(-2xz)^3$
- $(-2a^3b)^3$
- $(3r^3s)^2$
- $(5k^3m^2)^2$
- $(-3q^2r^2)^3$

4. Simplify.

- $(yz)^2(y^2z)$
- $(-2ab)(-ab)^2$
- $(5s^2t^2)^2(-st)$
- $(-4k^2m^3)^2(2km)^3$
- $(2r^2s^2t)(3rst)^2$
- $(4abc)^2(2a^2bc)(ab^3c^3)$
- $(m^2n^2p^2)^3(mnp)(-3nm^3p^3)$

5. Simplify.

- $(2a^4b^3) \div (a^2b)$
- $\frac{6q^3r^2}{3q^2r^2}$
- $(8x^6y^4) \div (-4x^3y^2)$
- $(-4w^3x^5) \div (-2w^2x^2)$
- $\frac{-9f^3g^5h^2}{6fg^2h}$
- $\frac{-12c^3d^5}{18c}$

6. Simplify.

a. $\frac{6k^2m^4}{3km^2}$

b. $4a^3b^2c + 2bc$

c. $8x^5y^3 + 2x^3y$

d. $\frac{-12s^7t^6}{8s^2t^2}$

e. $-9e^2f^4 \div (-6ef^2)$

f. $\frac{20d^5e^3f^5}{12d^2e^3f^4}$

Answers:

1.

- a. $3^5 = 243$
- b. $(-2)^5 = -32$
- c. $5^7 = 78125$
- d. $3 \cdot 2^4$
- e. y^6
- f. $3^2 = 9$
- g. $(-2)^{10} = 1024$
- h. $(-4.5)^2 = 20.25$
- i. $3^2 = 9$
- j. $(-7) = -7$
- k. $-1.2^2 = -1.44$
- l. $0.6^2 = 0.36$

2.

- a. $-6az^3$
- b. $-16r^2s$
- c. $-20cde$
- d. $6x^2y^2$
- e. $-6ab^2m^2$
- f. $-5u^2t^2$
- g. $-6a^2b^4c^3d$
- h. $-10r^3s^3t^3$
- i. $-60xyz$
- j. $-18d^2e$
- k. $8k^3m^2n^5$

3.

- a. $9t^2y^2$
- b. $-8x^3z^3$
- c. $-8a^6b^3$
- d. $9r^6s^2$
- e. $25k^6m^4$
- f. $-27q^6r^6$

4.

- a. y^5z^3
- b. $-2a^3b^3$
- c. $-25s^5t^5$
- d. $128k^7m^9$
- e. $18r^4s^4t^3$
- f. $32a^5b^6c^6$
- g. $-3m^{10}n^8p^{10}$

5.

- a. $2a^2b^2$
- b. $2q$
- c. $-2x^3y^2$
- d. $2wx^3$
- e. $-\frac{3}{2}f^2g^3h$
- f. $-\frac{2}{3}c^2d^5$

6.

- a. $2km^2$
- b. $2a^3b$
- c. $4x^2y^2$
- d. $-\frac{3}{2}s^5t^4$
- e. $\frac{3}{2}ef^2$
- f. $\frac{5}{3}d^3f$

P73 #18 April 7

#18. $ax^2 + bx + c = 0$ (standard) $a=?$, $b=?$, $c=?$

$$(-5 + \sqrt{3})(-5 - \sqrt{3}) = 0$$

$$a[x + (5 + \sqrt{3})][x + (5 - \sqrt{3})] = 0 \rightarrow \text{When } \begin{matrix} x = -3 \\ y = 8 \end{matrix}$$

$$\text{Two } x \text{ intercepts} = -(5 + \sqrt{3}) = -5 - \sqrt{3}$$

$$-(5 - \sqrt{3}) = -5 + \sqrt{3}$$

* Sub $x = -3$, $y = 8$ into equation

$$a \left[\overset{-3}{-3} + (5 + \sqrt{3}) \right] \left[\overset{-3}{-3} + (5 - \sqrt{3}) \right] = 8$$

$$a [2 + \sqrt{3}] [2 - \sqrt{3}] = 8$$

$$a [4 - 3] = 8$$

$$a [1] = 8$$

$$a = 8$$

$$\therefore 8 [x + (5 + \sqrt{3})] [x + (5 - \sqrt{3})] = 0$$

$$= 8 [x + 5 + \sqrt{3}] [x + 5 - \sqrt{3}] = 0$$

$$= 8 [x^2 + \textcircled{5x} - \sqrt{3}x + \textcircled{5x} + 25 - 5\sqrt{3} + \sqrt{3}x + 5\sqrt{3} - 3] = 0$$

$$= 8 [x^2 + 10x + 22] = 0$$

$$= 8x^2 + 80x + 176 = 0$$

$$\therefore a = 8, \quad b = 80, \quad c = 176$$