

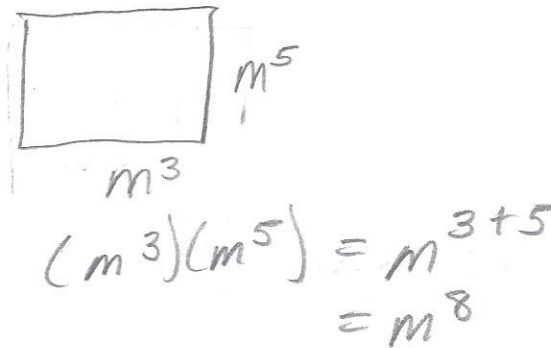
Algebra 1 Unit 6 - Laws of Exponents

Name Gonzalez Date 11/30 Pd \_\_\_\_\_

**Must Show Work For Credit**

- 1 A wall mosaic is being designed. The tiles for the wall make a rectangular grid consisting of  $m^3$  rows and  $m^5$  columns. Which expression shows the number of tiles on the wall?

- A  $m^8$
- B  $2m^3 + 2m^5$
- C  $m^3 + m^5$
- D  $m^{15}$



- 2 An algebraic expression involving rational exponents is shown below.

$$\frac{(64a^3b^4c^{-5})(32a^4b^3c^5)}{(256a^3b^6c^{-5})}$$

Which of the following represents the simplified expression?

- F  $\frac{8b}{a^2c^5}$
  - G  $\frac{8bc^5}{a^2}$
  - H  $\frac{4bc^5}{a^2}$
  - J  $8a^3b^6c^5$
- Handwritten work for question 2:
- $$\frac{(64)(32)a^{3+4}b^{4+3}c^{-5+5}}{256a^3b^6c^{-5}}$$
- $$\frac{2048a^7b^7c^0}{256a^3b^6c^{-5}}$$
- $$8a^{7-3}b^{7-6}c^{0-(-5)}$$
- $$8a^4b^1c^5 \xrightarrow{W \quad L \quad H} \frac{8bc^5}{a^2}$$

- 3 A rectangular prism has a width of  $x$  inches, a length of  $x^2y$  inches, and a height of  $y^2$  inches. Which expression represents the volume in cubic inches of this rectangular prism?

- A  $4x^2y^2$
- B  $4x^3y^3$
- C  $x^2y^2$
- D  $x^3y^3$

Handwritten work for question 3:

$$V = L \times W \times H$$

$$V = (x^2y)(x)(y^2)$$

$$x^{2+1}y^{1+2}$$

$$x^3y^3$$

4 Which expression is equivalent to  $\frac{14a^4b^6c^{-10}}{8a^{-2}b^3c^{-5}}$ ?

F  $\frac{7a^2b^3}{4c^{15}}$

G  $\frac{6a^2b^9}{c^{15}}$

H  $\frac{7a^6b^3}{4c^5}$

J  $\frac{7b^2c^2}{4a^2}$

$$\frac{14}{8} a^{4-(-2)} b^{6-3} c^{-10-(-5)}$$

$$\frac{7}{4} a^6 b^3 c^{-5}$$

$$\frac{7a^6b^3}{4c^5}$$

5 A circle has a radius of  $6x^9y^5$  cm. The area of a circle can be found using  $A = \pi r^2$ . What is the area of this circle in square centimeters?

A  $12\pi x^{18}y^{10}$

B  $36\pi x^{18}y^{10}$

C  $36\pi x^{11}y^7$

D  $12\pi x^{11}y^7$

$$A = \pi r^2$$

$$A = \pi (6x^9y^5)^2$$

$$A = \pi (6)^2 (x^9)^2 (y^5)^2$$

$$A = \pi 36 x^{18} y^{10}$$

6 A water tank in the shape of a cube has an edge  $x^2y$  cm long. Which expression represents the volume of the water tank?

F  $x^2y^3$  cm<sup>3</sup>

G  $x^5y^3$  cm<sup>3</sup>

**H**  $x^6y^3$  cm<sup>3</sup>

J  $x^9y^3$  cm<sup>3</sup>

$V = L \cdot W \cdot H$   
*cube, All sides same*  
 $V = L^3$   
 $V = (x^2y)^3$   
 $V = x^6y^3$

7 Simplify the following:

$$\frac{(4mn^{-3})^2(-2m^3n^2)}{6m^{-4}n^6}$$

A  $\frac{16m^{10}}{3n^{18}}$  •  $\frac{(4)^2(m)^2(n^{-3})^2(-2m^3n^2)}{6m^{-4}n^6}$

B  $\frac{-8m^9}{3n^{18}}$  •  $\frac{(16m^2n^{-6})(-2m^3n^2)}{6m^{-4}n^6}$

C  $\frac{-16m^9n^5}{3}$  •  $\frac{-32m^{2+3}n^{-6+2}}{6m^{-4}n^6}$

**D**  $\frac{-16m^9}{3n^{10}}$  •  $\frac{-32m^5n^{-4}}{6m^{-4}n^6}$

8 Simplify the following:

$$(3x^3y^2)(8x^4y^6)$$

F  $11x^7y^8$

G  $24x^{12}y^{12}$

**H**  $24x^7y^8$

J  $24x^{81}y^{64}$

$\frac{16}{3}m^{5-(-4)}n^{-4-6}$   
 $\frac{16}{3}m^9n^{-10}$   
 $\frac{16m^9}{3n^{10}}$   
 $(3)(8)x^{3+4}y^{2+6}$   
 $24x^7y^8$

9 Simplify the following:

$$(-3x^5y^3)^2(2x^3y^4)^3$$

**A**  $72x^{19}y^{18}$   $(-3)^2(x^5)^2(y^3)^2(2x^3y^4)^3$

B  $72x^{52}y^{73}$   $(9x^{10}y^6)(2)^3(x^3)^3(y^4)^3$

C  $-36x^{19}y^{18}$   $(9x^{10}y^6)(8x^9y^{12})$

D  $72x^{13}y^{12}$   $(9)(8)x^{10+9}y^{6+12}$

$72x^{19}y^{18}$

10 Simplify the following:

$$\frac{-16c^{-1}d^3}{4c^2d^{-3}}$$

F  $\frac{-4}{c^3}$

$\frac{16}{4}c^{-1-2}d^{3-(-3)}$

**G**  $\frac{-4d^6}{c^3}$

$4c^{-3}d^6$

H  $\frac{-4}{c}$

$\frac{4d^6}{c^3}$

J  $\frac{d^6}{-4c^3}$

~~11~~ Simplify the following:

$$\left(\frac{2x^3y^2}{3y^3}\right)^3$$

A  $\frac{8x^9y^3}{3}$

B  $\frac{8x^9y^3}{27}$

C  $\frac{8x^6y^3}{27y}$

D  $\frac{8x^6y^3}{27}$

12 Simplify the following:

$$\frac{18a^4b^9}{6a^8b^3}$$

F  $\frac{3b^6}{a^4}$

G  $\frac{3b^6}{a^2}$

H  $\frac{12b^6}{a^4}$

J  $\frac{12b^3}{a^2}$

$$\frac{18}{6} a^{4-8} b^{9-3}$$

$$3a^{-4}b^6$$

$$\frac{3b^6}{a^4}$$