

Honors Algebra II

Notes Section 2.1 Use Properties of Exponents

PROPERTIES

I. Product of Powers _____

II. Power to a Power _____

III. Power of a Product _____

IV. Negative Exponent _____

V. Zero Exponent _____

VI. Quotient of Powers _____

VII. Power of a Quotient _____

EXAMPLE 1 Evaluate.

a) $(-4 \cdot 2^5)^2 =$ _____

b) $\frac{11^{5-1}}{11^8} =$ _____

c) $(4^2)^3 =$ _____

d) $(-8)(-8)^3 =$ _____

e) $\frac{2^3}{9} =$ _____

EXAMPLE 2 A swarm of locusts may contain as many as 85 million locusts/km². About how many locusts are in such a swarm?

$$\# \text{ of locusts} = \text{locusts/km}^2 \cdot \# \text{ km}^2$$

EXAMPLE 3 Simplify.

a) $b^{-4}b^6b^7 =$ _____

b) $r^{-2} \cdot s^{-3} =$ _____
 s^3

c) $16m^4n^{-5} =$ _____
 $2n^{-5}$

d) $(7y^2z^5)(y^{-4}z^{-1}) =$ _____

e) $s^3 \cdot t^2 =$ _____
 t^{-4}

f) $x^4y^{-2} \cdot z^3 =$ _____
 x^3y^6

EXAMPLE 4 Simplify. Betelgeuse is one of the stars found in the constellation Orion. Its radius is about 150 times the radius of the sun. How many times as great as the sun's volume is Betelgeuse volume?

$$\text{Volume of a Sphere} = \frac{4}{3}\pi r^3$$

Betelgeuse's Volume =

Sun's Volume