Test Outline

Unit 2: Powers and the Exponent Laws

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Study Guide

Powers

$9^2 = 9 \times 9$

- Base
- Exponent
- Repeated Multiplication
- The Zero Exponent
- Powers of ten
- Expanded form to Standard form and vice versa

Order of Operations

BEDMAS

Exponent Laws

- Product of Powers
- Quotient of Powers
- Power of a Power
- Power of a Product
- Power of a Quotient

Exponent Laws

1) Zero Rule $(-1)^0 = 1$

$1^0 = 1$ $\quad -1^0 = -1$

$-(-1)^0 = -1$ $\quad (6535)^0 = 1$

2) Product of Powers Rule

$2^3 \times 2^4 = 2^{(3+4)} = 2^7$

3) Quotient Rule

$\frac{2^4}{2^3} = 2^{(4-3)} = 2^1$

4) Power to a Power Rule

$(2^3)^4 = 2^{(3\times4)} = 2^{12}$

5) Power of Product Rule

$(2^3 \times 3^2)^2 = 2^{(3\times2)} \times 3^{(2\times2)}$

$2^6 \times 3^4$

6) Power of Quotient Rule

$\left(\frac{2^4}{3^2}\right)^2 = \frac{2^{(4\times2)}}{3^{(2\times2)}} = \frac{2^8}{3^4}$

Unit 2 Test Review

1)

Write the BASE and the EXPONENT of these powers:

a) 3^5

Base: 3

Exponent: 5

b) $(-2)^8$

Base: -2

Exponent: 8

c) -6^7

Base: 6

Exponent: 7

2)

Write the following as the respecting base:

a) $1296 = 6^{?}$ 4

1296 → 216, 6 → 36, 6 → 6, 6

b) $512 = 2^{?}$ 9

512 → 256, 2 → 128, 2 → 64, 2 → 32, 2 → 16, 2 → 8, 2 → 4, 2 → 2, 2

3)Write the following in standard form

$(6 \times 10^4) + (7 \times 10^2) + (9 \times 10^5) + (4 \times 10^0)$

600000 + 700 + 900000 + 4

960 704

4) Write the following numbers using powers of 10

530 281

$(5 \times 10^5) + (3 \times 10^4) + (2 \times 10^2) +$

$(8 \times 10^1) + (1 \times 10^0)$

5) Simplify then evaluate

a) $[-(3)^2]^5$

$-(3)^{10}$

-59049

b) $5^7 \div 5^3 - 2^4 \times 2^3$

$5^4 - 2^7$

$625 - 128$

497

c) $(-3)^1 \times (-3)^2 + (-3)^5 \div (-3)^0$

$(-3)^3 + (-3)^5$

$-27 + -243$

-270

d) $\left[\frac{(-2)^7 \times (-2)^8}{(-2)^6 \times (-2)^5}\right]^2 \left[\frac{(-2)^{15}}{(-2)^{11}}\right]^2$

$\frac{(-2)^{30}}{(-2)^{22}}\Big] - (-2)^8$

$= 256$

Simplify

$$\frac{(7^2)^3 \times (5^3)^4 \times (7^5)^3 \times (5^4)^3}{(5^4)^2 \times (7^3)^2 \times (5^2)^4 \times (7^5)^2}$$

$$\frac{7^6 \times 5^{12} \times 7^{15} \times 5^{12}}{5^8 \times 7^6 \times 5^8 \times 7^{12}}$$

$$\frac{7^{21} \times 5^{24}}{7^{18} \times 5^{16}}$$

$$7^3 \times 5^8$$

show your work

$$\frac{[3 \times 5]^2 - 7^2 + 3 \times 8 \div 2}{-(20)^0 - 1}$$

$$\frac{(15)^2 - 7^2 + 3 \times 8 \div 2}{-(20)^0 - 1}$$

$$\frac{225 - 49 + 12}{-(1) - 1}$$

$$\div 2$$

$$= -94$$

Extra Practice Review W.S.

Test Thursday