2.6 - Mid-Unit Review II

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Name: KEY Date:

Math 9 Chapter 2.3 to 2.5 Review

Multiplication Rule:

$$a^m \times a^n = a^{m+n}$$

When **multiplying powers** with the same base, you **ADD** the exponents

Division Rule:

$$a^m \div a^n = a^{m-n}$$

When **dividing powers** with the same base, you **SUBTRACT** the exponents

Power to another Power Rule:

$$\left(a^m\right)^n = a^{m \times n}$$

When **taking powers to another exponent**, you **MULTIPLY** them

1. Evaluate each of the following expressions:

a) $8 \times 3 - 5 + 6^2$ 55	b) $2 \div 8 \times 4 \div 2 + 6$ 6.5	c) $8 - 2^2 + 5 - 4 - 6$ -1
d) $2 \times 3^3 + 4^2 - 5^2$ 45	e) $2 \times 4 - (5-8)^2$ -1	f) $6^3 \times (-3)^2 + 12$ 1956
g) $9 - 2 \times \left[2 - (7-4)\right]^2$ 7	h) $20 - 3(-6+12)^2$ -88	i) $\left[9 + (5 - (6+2))^3\right] - 2^3$ -26

2. Simplify each of the following expressions into a single power:

a) $7^4 \times 7^3$ 7^7	b) $2^1 \times 2^2 \times 2^3$ 2^6
c) $4^8 \div 4^4$ 4^4	d) $(3^4)(3^{-2}) \div 3^{-3}$ $3^{4+-2-(-3)} = 3^5$
e) $(7^2)^5 \div 7^{11}$ 7^{-1}	f) $(5^3)^2 \times 5^{-2} \times 5^3$ $5^{6+-2+3} = 5^7$

3. Evaluate each of the following expressions using BEDMAS:

a) $(-6)^7 \div (-6)^5 - (-6)^4 \div (-6)^3$ $(-6)^2 - (-6)^1 = 42$	b) $3^4\left(3^{12} \div 3^8\right) - 3^4$ $3^4 \cdot 3^4 - 3^4 = 6{,}480$
c) $\dfrac{12^8 \times 12^4}{12^{10}}$ $= \dfrac{12^{12}}{12^{10}} = 12^2 = 144$	d) $\left(8^3 \times 8^5\right)^2 - \left(8^{12} \div 8^8\right)^4$ $8^{16} - 8^{16} = 0$
e) $\dfrac{(64)^3 \times 16}{8^{12}} - 2^2 + 2$ Skip!	f) $\left[(-3)^4 \times (-3)^3\right]^2 + \left[(-3)^4 \times (-3)^3\right]^2$ $(-3)^{14} + (-3)^{14} = 9{,}565{,}938$

4. Find the value of ◆ in each expression:

a) $(-3)^4 \times (-3)^{\blacklozenge} = (-3)^5$ ◆ = 1

b) $(-2)^{15} \div (-2)^{10} = (-2)^{\blacklozenge}$ ◆ = 5

c) $7^8 \times 7^7 \div 7^{\blacklozenge} = 7^4$ ◆ = 11

d) $2^{\blacklozenge} \div 2^6 \times 2^{-4} = 2^{11}$ ◆ = 21

e) $\left(6^4\right)^4 = 6^{\blacklozenge}$ ◆ = 16

f) $\left(3^4\right)^3 \div 3^{\blacklozenge} = 3^5$ ◆ = 7

5. Given that "a" and "b" are integers greater than zero, what is the value of "a" and "b"?

a) $\left(a \times b^2\right)^4 = 81 \times 256$ $a = 3$ $b = 2$	b) $(25 \times 64)^3 = a \times 2^b$ $a = 25^3$ $b = 18$
c) $\left(49^2 \times 11\right)^3 = 7^a \times b$ $a = 12$ $b = 11^3$	d) $(24)^6 = 2^a \times 3^b$ $24^6 = (8 \times 3)^6 = 2^a \times 3^b$ $a = 18 \quad b = 6$

$a = 12$

$b = 11^3$

$24 = (8 \times 3) = 2 \times 3$

$a = 18 \quad b = 6$