THINKING WRITING

8.C Applying the Laws of Exponents

Tina overslept and had to skip breakfast, so she didn't do very well on her math test. Besides, she had forgotten to study the laws of exponents. In fact, she missed *all* the problems.

Test Name: *Tina A.*

Exponents

Instructions: Simplify. Your answer should have only one exponent. Not all are possible.

a. $2^4 \cdot 3^4 = 5^4$

b. $3^{15} + 6^{15} = 9^{15}$

c. $3x^2 \cdot 2x^3 = 5x^5$

d. $\frac{x^7}{y^3} = \left(\frac{x}{y}\right)^4$

e. $10x^5 \cdot 8x^9 = 80x^{45}$

f. $(2x)^7 = 2x^7$

g. $12x^3 \cdot 4y^7 = 48(xy)^{10}$

h. $\left(\frac{3^7}{3^5}\right)^3 = 1^6$

i. $(3x^2)^3 = 3x^5$

j. $x^3 + x^2 = x^5$

1. Summarize the five laws of exponents given in Lessons 9, 10, and 11.

2. Correct Tina's test. For each problem, write the correct answer. If one or more of the laws of exponents was used, tell which law (or laws) was used. If the expression cannot be simplified, say so.

3. Take Tina's make-up test for her. Be careful! (Remember, make-up tests are always harder.)

Make-up Test Name: *Tina A.*

Laws of Exponents

Instructions: Show all work leading to your answer.

a. Write without parentheses: $(4x^2y^3z)^3$

Perform each operation, and *if possible* write the result as a power of 5.

b. $5^{11} - 5^9$

c. $5^{x+3}/5^x$

d. $5^5 \cdot \_\_ = 5^{15}$

e. $5^7 + 5^3$

If possible, write as a power of 12.

f. $3 \cdot 4^3$

g. $(3 \cdot 4)^5$

h. $2 \cdot 6^8$

i. $2^8 \cdot 6^8$

j. $2^8 \cdot 6^5$

Which expression is not equal to the other two?

k. 3^{100} 6^{75} 9^{50}

l. $(y^2)^4$ $(y^4)^2$ y^4y^2

m. a^7 $a^3 + a^4$ $a^3 \cdot a^4$

Write the opposite of the reciprocal of $(1/2)^5$

n. using a negative exponent;

o. using a positive exponent.