NAME _____ DATE _____

Module Test A

Module 11

Determine whether each statement is true or false.

1. $6^2 \cdot 6^3 = 6^5$ **True**
2. $x^3 \cdot x^4 = x^{12}$ **False**
3. $x^3 \cdot y^5 = (xy)^8$ **False**
4. $\frac{y^6}{y^2} = y^3$ **False**
5. $(x^3)^2 = x^6$ **True**
6. Any nonzero number raised to a power of zero is equal to zero. **False**
7. The number 36.1×10^8 is written in scientific notation. **False**
8. $3x^2 + 5x^2 = 8x^2$ **True**

Choose the correct response for each problem.

9. Simplify: $(x^2y)^4$.
   a. x^8y^4 **b.** x^2y^4 **c.** x^8y^5 **d.** x^6y^4
10. Determine which of the following is not equal to 81.
   a. $(3^2)^2$ **b.** $(-3)^4$ **c.** 3^{-4} **d.** 3^4
11. Simplify: $(x + 8)(x - 8)$.
   a. $x^2 - 64$ **b.** $x^2 + 64$ **c.** $x^2 - 16$ **d.** $x^2 + 16$
12. Simplify: $(2x + 9)^2$.
   a. $4x^2 - 81$ **b.** $4x^2 + 81$ **c.** $4x^2 - 36x + 81$ **d.** $4x^2 + 36x + 81$
13. Write 2.53×10^4 in standard form.
   a. 0.0000253 **b.** 0.000253 **c.** 25,300 **d.** 2,530,000
14. Write 7×10^{-2} in standard form.
   a. 0.007 **b.** 0.07 **c.** 70 **d.** 700

15. Evaluate and leave answers in scientific notation.

a. $(4 \times 10^{-2})(2 \times 10^{7})$ 8×10^{5}

b. $(2.5 \times 10^{4})(6 \times 10^{3})$ 1.5×10^{8}

c. $(1.3 \times 10^{2})(5 \times 10^{-7})$ 6.5×10^{-5}

d. $\frac{3.6 \times 10^{5}}{1.2 \times 10^{-2}}$ 3×10^{7}

e. $\frac{3 \times 10^{15}}{6 \times 10^{2}}$ 5×10^{12}

16. Simplify the expressions by combining like terms.

a. $(5x^2 - 6x + 1) + (x^2 - 2x - 4)$ $6x^2 - 8x - 3$

b. $(a^3 - 2a) + (-a^3 + 2a)$ 0

c. $(6x - 2y) - (5x - 4y + 1)$ $x + 2y - 1$

d. $(5h^3 - 2h) + (h^3 + h^2)$ $6h^3 + h^2 - 2h$

e. $(k^3 - 7k) - (3k - k^4)$ $k^4 + k^3 - 10k$

17. Simplify the expressions by performing the indicated multiplication.

a. $2x^2y^4 \cdot 3xy^3$ $6x^3y^7$

b. $-4ab^2(2a^2 - b)$ $-8a^3b^2 + 4ab^3$

c. $(x + 4)(x + 5)$ $x^2 + 9x + 20$

d. $(x + 5)(x - 5)$ $x^2 - 25$

e. $(x - 3)(x^2 + 3x + 9)$ $x^3 - 27$

18. Simplify the expressions by performing the indicated division.

a. $\frac{8x^6y^4}{12x^2y}$ $\frac{2}{3}x^4y^3$

b. $\frac{6b^3 + 8b^2 - 2b}{2b}$ $3b^2 + 4b - 1$

c. $(x^2 + 4x - 21) \div (x - 3)$ $x + 7$

d. $(6x^2 - 4 + 12x) \div (2x + 5)$ $3x - \frac{3}{2} + \frac{7}{2(2x+5)}$ or $3x - \frac{3}{2}$ remainder $\frac{7}{2}$

e. $(y^3 - 64) \div (y - 4)$ $y^2 + 4y + 16$

Answer these questions using the directions given.

19. Write the *multiplication rule for exponents* algebraically. Then, explain the rule with a complete sentence. $a^m \cdot a^n = a^{m+n}$, $a \neq 0$; To multiply nonzero terms with the same base, keep the base the same and add their exponents.

20. What words do the letters in FOIL represent? Explain how this Method is used to multiply two binomials. Use complete sentences.

FOIL stands for First, Outer, Inner, and Last. In multiplying two binomials, the first terms in each parentheses are multiplied; the outer terms (first term of first parentheses and second term of second parentheses) are multiplied; the inner terms (second term of first parentheses and first term of second parentheses) are multiplied; and the last terms in each parentheses are multiplied. Like terms are then added, resulting in the product of the binomial multiplication.