

# Module Test **B**

## Module 11

Determine whether each statement is true or false.

- $5^7 \cdot 5^4 = 25^{11}$  **False** \_\_\_\_\_
- $y^6 \cdot y^2 = y^8$  **True** \_\_\_\_\_
- $x^3 \cdot y^5 = (xy)^{15}$  **False** \_\_\_\_\_
- $\frac{x^7}{x^4} = x^3$  **True** \_\_\_\_\_
- $(x^4)^5 = x^9$  **False** \_\_\_\_\_
- Any non-zero number raised to a power of zero is equal to one. **True** \_\_\_\_\_
- The number  $5.2 \times 10^{-3}$  is written in scientific notation. **True** \_\_\_\_\_
- $6x^3 + 2x^3 = 8x^6$  **False** \_\_\_\_\_

Choose the correct response for each problem.

- Simplify:  $(a^3b^5)^2$ .  
 a.  $a^3b^{10}$       b.  $a^5b^7$       c.  $a^9b^{25}$       **d.  $a^6b^{10}$**
- Determine which of the following is not equal to  $\frac{1}{16}$ .  
 a.  $2^{-4}$       **b.  $(-4)^2$**       c.  $4^{-2}$       d.  $(\frac{1}{2})^4$
- Simplify:  $(4x - 5)(4x + 5)$ .  
 a.  $x^2 - 40x + 25$       b.  $4x^2 - 25$       **c.  $16x^2 - 25$**       d.  $8x^2 - 10$
- Simplify:  $(x - 4)^2$ .  
 a.  $x^2 - 16$       b.  $x^2 + 8x + 16$       c.  $x^2 - 8x - 16$       **d.  $x^2 - 8x + 16$**
- Write  $1.6 \times 10^3$  in standard form.  
 a. 16,000      **b. 1,600**      c. 0.00016      d. 0.0016
- Write  $3 \times 10^{-5}$  in standard form.  
**a. 0.00003**      b. 0.000003      c. 30,000      d. 300,000

15. Evaluate and leave answers in scientific notation.

- a.  $\frac{7.2 \times 10^3}{2 \times 10^{11}}$   $3.6 \times 10^{-8}$
- b.  $\frac{3.2 \times 10^{15}}{1.6 \times 10^4}$   $2 \times 10^{11}$
- c.  $\frac{1.5 \times 10^8}{6 \times 10^3}$   $2.5 \times 10^4$
- d.  $(3 \times 10^6)(3 \times 10^{-1})$   $9 \times 10^5$
- e.  $(5.1 \times 10^{-9})(2 \times 10^{-4})$   $1.02 \times 10^{-12}$

16. Simplify the expressions by combining like terms.

- a.  $(3a + c - 2b) + (2c - 5b + a)$   $4a - 7b + 3c$
- b.  $(3x^2 + xy - 2y^2) - (x^2 - 7xy + y^2)$   $2x^2 + 8xy - 3y^2$
- c.  $(y^3 + 4y - 1) - (2y^3 - 5y^2 + y)$   $-y^3 + 5y^2 + 3y - 1$
- d.  $(3x^2 + xy - 2y^2) - (x^2 - 7xy + y^2)$   $2x^2 + 8xy - 3y^2$
- e.  $(6p^2 + 7) + (3p^2 - 4p + 2)$   $9p^2 - 4p + 9$

17. Simplify the expressions by performing the indicated multiplication.

- a.  $-3x(x^3 - 4x)$   $-3x^4 + 12x^2$
- b.  $r^3s^2(r^2 + 3rs - s^2)$   $r^5s^2 + 3r^4s^3 - r^3s^4$
- c.  $(x + 7y)(x - 4y)$   $x^2 + 3xy - 28y^2$
- d.  $(x - 1)^2$   $x^2 - 2x + 1$
- e.  $(x + 3y)^2$   $x^2 + 6xy + 9y^2$

18. Simplify the expressions by performing the indicated division.

- a.  $\frac{10a^7b^4}{2ab^{-3}}$   $5a^6b^7$
- b.  $\frac{6x^6 - 12x^4 + 3x^2}{3x^2}$   $2x^4 - 4x^2 + 1$
- c.  $(2x^3 + 20 - 5x^2 - 17x) \div (x - 4)$   $2x^2 + 3x - 5$
- d.  $(3a^2 - 11a + 7) \div (3a - 5)$   $a - 2 + \frac{-3}{3a - 5}$
- e.  $(x^3 + 6x^2 - 14) \div (x + 2)$   $x^2 + 4x - 8 + \frac{2}{x + 2}$

Answer these questions using the directions given.

19. Write the *division rule* for exponents algebraically. Then, explain the rule with a complete sentence.  $\frac{a^m}{a^n} = a^{m-n}$ ,  $a \neq 0$  ; To divide nonzero terms with the

same base, keep the base the same and subtract their exponents.

20. Explain how using the Distributive Property twice and the FOIL Method are related for finding the product of two binomials. Use complete sentences.

**When using the Distributive Property, distribute the second binomial over the first binomial. Then, distribute the monomial terms over the binomial. For example,  $(x + 3)(x + 2) = x(x + 2) + 3(x + 2) = x^2 + 2x + 3x + 6$ . The terms of the last expression correspond to First, Outer, Inner, and Last, respectively, in the FOIL Method. Using either method, when multiplying binomials, will produce the same result.**

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