

NAME _____

DATE _____

Module Test **B**

Module 12

Fill in the blanks with the terms that best complete each statement.

- Factoring a polynomial is rewriting the polynomial as the _____ of simpler expressions.
- The product of _____ is also called the product of the sum and difference.
- The constants in the binomial factors of the trinomial $x^2 + bx + c$ must have a product of _____ and a sum of _____.
- A polynomial is factored completely when each factor is either a _____ or a _____.

Are the following statements true or false?

- | | |
|--|---|
| <p>5. When factoring any polynomial, the first thing to be done is to group terms with common factors.</p> <p>_____</p> | <p>6. The common factor of a polynomial expression can be a binomial.</p> <p>_____</p> |
| <p>7. When factoring by grouping, the terms of the polynomial may have to be rearranged.</p> <p>_____</p> | <p>8. For any real a and b, $a^2 - b^2$ cannot be factored.</p> <p>_____</p> |
| <p>9. $(a + b)$ and $(b - a)$ are conjugates.</p> <p>_____</p> | <p>10. The factorization of $a^2 - b^2$ is $(a - b)^2$.</p> <p>_____</p> |
| <p>11. A polynomial is called prime only after it is determined that the polynomial cannot be factored by any method.</p> <p>_____</p> | <p>12. $\frac{x+3}{3}$ is equivalent to $x + 1$.</p> <p>_____</p> |

Choose the correct response to each of the following:

13. According to the Distributive Property, $a(b + c) =$
 a. $a + b + c$ b. $ab + c$ c. $b + ac$ d. $ab + ac$
14. Factoring out the greatest common factor is the reverse of the
 a. Distributive Property b. FOIL Method c. Product of Conjugates
15. Factoring a quadratic trinomial is the reverse of the
 a. Distributive Property b. FOIL Method c. Product of Conjugates
16. Find the greatest common monomial factor of $12x^5 - 18y^3$.
 a. 6 b. 2 c. 3 d. There is no common factor.
17. Find the greatest common monomial factor of $a^2 + b^2$.
 a. a^2 b. b^2 c. $(ab)^2$ d. There is no common factor.
18. Which of the following **cannot** be factored by grouping?
 a. $n^2 - 42 - n$ b. $10 - xy - 2y + 5x$
 c. $x^2 + 25$ d. $8d^2 + 10d - 25$
19. When grouped, $xy - 2x - 3y + 6$ can be correctly written as
 a. $(xy - 2x) - (3y + 6)$ b. $(xy - 2x) + (3y - 6)$
 c. $(xy - 2x) - (3y - 6)$ d. $(xy - 2x) + (-3y - 6)$
20. Given that the factors of $x^2 + bx + c$ are $(x + r)(x + s)$, if $b > 0$ and $c > 0$, then
 a. $r > 0, s > 0$ b. either $r < 0, s > 0$ or $r > 0, s < 0$ c. $r < 0, s < 0$

21. Factor, if possible.

a. $18c - 6$

b. $12y^2 + y - 6$

c. $r^2 - 1$

d. $x^2 + 6x + 8$

e. $7x^2y^4 + 5x^3y^2 + 2x^2y^3$

f. $36 - b^2$

g. $ab + 2b - a - 2$

h. $m^2 + 13m - 30$

i. $8t^2 - 22t + 15$

j. $y^2 + 49$

k. $4x^2 - 3x - 22$

l. $b^2 - c^2$

22. Factor completely.

a. $x^3 + 5x^2 - 9x - 45$ _____

b. $2b^5 - 162b$ _____

c. $a^3b + 2a^2b^2 + ab^3$ _____

d. $25y^5 - y^3$ _____

23. Divide by factoring.

a. $\frac{y^2 - 16}{y + 4}$ _____

b. $\frac{4x^2 + 5x - 6}{4x - 3}$ _____

c. $\frac{8k^2 - 14k + 3}{8k - 12}$ _____

d. $\frac{m^2 - 8m + 15}{5m - 15}$ _____

Answer the following questions.

- 24.** Explain how a quadratic trinomial can be rewritten as a four-term polynomial so that it may be factored by grouping.

- 25.** List, in the correct order, the four steps of the *guess-and-check* method for factoring quadratic trinomials. Explain when this method might not be the most efficient process for factoring this type of trinomial.

