

5.5 Choosing a Factoring Method

Solutions

<p>Select which description matches each of the following polynomial types.</p> <p>(a) Trinomial with no Greatest Common Factor (b) Trinomial with Greatest Common Factor (c) Polynomial with Four Terms</p> <p>(d) Difference of Squares (e) Sum of Cubes (f) Prime Binomial</p>	
<p>1. $4x^2 - 25$ (d) Difference of Squares</p>	<p>2. $2x^2 + 3x - 5$</p>
<p>3. $ax - 2x + 3a - 6$ (c) Polynomial with Four Terms</p>	<p>4. $27x^3 + 64$</p>
<p>5. $x^2 + 16$ (f) Prime Binomial</p>	<p>6. $3x^2 + 6x - 45$</p>
<p>Select the phrase that correctly completes each of the following statements.</p> <p>(a) try to factor by grouping or by the box method (b) rewrite the middle term as a sum of two terms and then factor the polynomial with 4 terms (c) try to factor out a GCF</p> <p>(d) difference of squares or sum or difference of cubes (e) see if anything factors further (f) multiply the factors to verify that the product is equal to the original polynomial</p>	
<p>7. The first step you should take when factoring a polynomial is to (c). try to factor out a GCF</p>	<p>8. For a binomial with no common factors, determine if it is a _____.</p>
<p>9. For a polynomial with 4 terms having no common factor (a). try to factor by grouping or by the box method</p>	<p>10. To check that you have factored a polynomial correctly, _____.</p>
<p>11. One possible method for factoring a trinomial is to (b). rewrite the middle term as a sum of two terms and then factor the polynomial with 4 terms</p>	<p>12. After factoring a polynomial, you should _____.</p>
<p>Answers: 1. (d); 3. (c); 5. (f); 7. (c); 9. (a); 11. (b)</p>	

Factor each polynomial completely.

13. $2x^2 - 128 = 2(x^2 - 64)$

$$= 2(x^2 - 8^2)$$

$$= 2(x + 8)(x - 8)$$

14. $6x^2 - 54$

15. $2x^2 + 162 = 2(x^2 + 81)$

$$= 2(x^2 + 81)$$

16. $3x^2 + 48$

17. $x^2 - 11x + 24$

$$= (x - 3)(x - 8)$$

Product 24	
1	24
2	12
3	8
-3	-8
Sum -11	

18. $x^2 + 11x - 12$

19. $27x^3 + 1 = (3x)^3 + 1^3$

$$= (3x + 1)((3x)^2 - 1 \cdot 3x + 1^2)$$

$$= (3x + 1)(9x^2 - 3x + 1)$$

20. $a^3 + 8$

Answers: 13. $2(x + 8)(x - 8)$; 15. $2(x^2 + 81)$; 17. $(x - 3)(x - 8)$; 19. $(3x + 1)(9x^2 - 3x + 1)$

Factor each polynomial completely.

21. $4ax - 15 + 6a - 10x$
 $= 4ax + 6a - 10x - 15$

	$2x$	3
$2a$	$4ax$	$6a$
-5	$-10x$	-15

$= (2a - 5)(2x + 3)$

22. $2x^2 + x - 9 - 18x$

23. $6x^2 + x - 7$

Step 1:

Product -42	
-1	42
-2	21
-3	14
-6	7
Sum 1	

Step 2:

$= 6x^2 - 6x + 7x - 7$

Step 4:

$= (6x + 7)(x - 1)$

Step 3:

	x	-1
$6x$	$6x^2$	$-6x$
7	$7x$	-7

24. $2x^2 - 11x - 6$

25. $x^4 - 16 = (x^2)^2 - 4^2$

$= (x^2 + 4)(x^2 - 4)$

$= (x^2 + 4)(x + 2)(x - 2)$

26. $x^4 - y^4$

27. $x^6 - 1 = (x^3)^2 - 1^2$

$= (x^3 + 1)(x^3 - 1)$

$= (x^3 + 1^3)(x^3 - 1^3)$

$= (x + 1)(x^2 - 1x + 1^2)(x - 1)(x^2 + 1x + 1^2)$

$= (x + 1)(x^2 - x + 1)(x - 1)(x^2 + x + 1)$

28. $64 - y^6$

Answers: 21. $(2a - 5)(2x + 3)$; 23. $(6x + 7)(x - 1)$; 25. $(x^2 + 4)(x + 2)(x - 2)$; 27. $(x + 1)(x^2 - x + 1)(x - 1)(x^2 + x + 1)$