

**1.5 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. <math>4x^2 - 25</math> <b>(d) Difference of Squares</b></p>	<p>2. <math>2x^2 + 3x - 5</math></p>
<p>3. <math>ax - 2x + 3a - 6</math> <b>(c) Polynomial with Four Terms</b></p>	<p>4. <math>27x^3 + 64</math></p>
<p>5. <math>x^2 + 16</math> <b>(f) Prime Binomial</b></p>	<p>6. <math>3x^2 + 6x - 45</math></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 <b>(c)</b>. <b>try to factor out a GCF</b></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 <b>(a)</b>. <b>try to factor by grouping or by the box method</b></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>(b)</b>. <b>rewrite the middle term as a sum of two terms and then factor the polynomial with 4 terms</b></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.  $(x + 1)(x^2 - x + 1)(x - 1)(x^2 + x + 1)$