Name _____ Date _____ Class _____

LESSON 8-6

Practice B

Choosing a Factoring Method

Tell whether each polynomial is completely factored. If not, factor it.

1. $6(t^2 + 12)$

2. $5(m^2 + 9m)$

3. $2p(p^4 - 9)$

4. $(x - 8)(2x + 3)$

5. $3k^3(5k^2 + 19)$

6. $7(14g^4 - 4g + 10)$

Factor each polynomial completely.

7. $24x + 40$

8. $5r^3 - 10r$

9. $3x^3y + x^2y^2$

10. $-3a^2b + 12ab - 12b$

11. $5t^3 - 45t + 3t^2 - 27$

12. $2y^2 - 6y - 56$

13. $6a^3 + 39a^2 + 45a$

14. $x^3 - 9x$

15. $12n^3 - 48$

16. $3c^4 + 24c^3 + 48c^2$

17. $3d^3 + 4d - 2$

18. $10w^6 - 160w^2$

LESSON 8-6

Practice A

Choosing a Factoring Method

Tell whether each polynomial is completely factored. If not, factor it.

1. $3(b^3 - 5)$ — yes
2. $2(n^3 + 4n^2)$ — no; $2n^2(n + 4)$
3. $8y(y^2 + 1)$ — yes
4. $(t - 6)(3t + 5)$ — yes
5. $2(m^2 + 10m + 9)$ — no; $2(m + 9)(m + 1)$
6. $(2p - 8)(p + 3)$ — no; $2(p - 4)(p + 3)$

Factor out a GCF. Then continue to factor by using other methods.

7. $45g^2 - 20$ — $5(3g + 2)(3g - 2)$
8. $3w^3 + 30w^2 + 75w$ — $3w(w + 5)^2$
9. $12x^2y - 48xy + 48y$ — $12y(x - 2)^2$
10. $-3d^3 + 300d$ — $-3d(d - 10)(d + 10)$
11. $2a^2 - 32$ — $2(a + 4)(a - 4)$
12. $5m^2 - 5m - 60$ — $5(m + 3)(m - 4)$

Factor completely.

13. $c^2 + 7c - 18$ — $(c + 9)(c - 2)$
14. $2x^2 + 8x + 6$ — $2(x + 3)(x + 1)$
15. $f^3 - 3f^2 + 4f - 12$ — $(f^2 + 4)(f - 3)$
16. $-6k^2 + 39k - 18$ — $-3(k - 6)(2k - 1)$
17. $p^8 - m^4$ — $(p^4 + m^2)(p^2 + m)(p^2 - m)$
18. $2a(a^2 - 1) + 7(a^2 - 1)$ — $(a + 1)(a - 1)(2a + 7)$

LESSON 8-6

Practice B

Choosing a Factoring Method

Tell whether each polynomial is completely factored. If not, factor it.

1. $6(t^2 + 12)$ — yes
2. $5(m^2 + 9m)$ — no; $5m(m + 9)$
3. $2p(p^4 - 9)$ — no; $2p(p^2 + 3)(p^2 - 3)$
4. $(x - 8)(2x + 3)$ — yes
5. $3k^3(5k^2 + 19)$ — yes
6. $7(14g^4 - 4g + 10)$ — no; $14(7g^4 - 2g + 5)$

Factor each polynomial completely.

7. $24x + 40$ — $8(3x + 5)$
8. $5r^3 - 10r$ — $5r(r^2 - 2)$
9. $3x^3y + x^2y^2$ — $x^2y(3x + y)$
10. $-3a^2b + 12ab - 12b$ — $-3b(a - 2)^2$
11. $5t^3 - 45t + 3t^2 - 27$ — $(5t + 3)(t + 3)(t - 3)$
12. $2y^2 - 6y - 56$ — $2(y + 4)(y - 7)$
13. $6a^3 + 39a^2 + 45a$ — $3a(2a + 3)(a + 5)$
14. $x^3 - 9x$ — $x(x - 3)(x + 3)$
15. $12n^3 - 48$ — $12(n^3 - 4)$
16. $3c^4 + 24c^3 + 48c^2$ — $3c^2(c + 4)^2$
17. $3d^3 + 4d - 2$ — unfactorable
18. $10w^6 - 160w^2$ — $10w^2(w^2 + 4)(w - 2)(w + 2)$

LESSON 8-6

Practice C

Choosing a Factoring Method

Tell whether each polynomial is completely factored. If not, factor it.

1. $4(n^4 - 8)$ — yes
2. $12h^2(g^2 + 6gh)$ — no; $12h^2g(g + 6h)$
3. $7(t^2 + 16)$ — yes
4. $(y + 9)(4y - 3)$ — yes
5. $5x^4(12x^3 - 6x^2 - 18x)$ — no; $30x^5(2x - 3)(x + 1)$
6. $(6b + 3)(b - 5)$ — no; $3(2b + 1)(b - 5)$

Factor each polynomial completely.

7. $-2r + 16$ — $-2(r - 8)$
8. $60c + 45c^2$ — $15c(4 + 3c)$
9. $24xy^5 + 9y^4$ — $3y^4(8xy + 3)$
10. $10k^3 - 80k^2 + 160k$ — $10k(k - 4)^2$
11. $3a^2 + 9a - 54$ — $3(a + 6)(a - 3)$
12. $5t^2 + 2t + 3$ — unfactorable
13. $-4f^3 - 14f^2 + 8f$ — $-2f(2f - 1)(f + 4)$
14. $m^5 - 25m^3$ — $m^3(m + 5)(m - 5)$
15. $8w^4 + 96w^2 + 288$ — $8(w^2 + 6)^2$
16. $6h^4 - 5h + 9$ — unfactorable
17. $4d^6 - 20d^5 + 12d^4 - 60d^3$ — $4d^3(d^2 + 3)(d - 5)$
18. $m^8n^2 - n^{18} - m^8 + n^{16}$ — $(m^4 + n^8)(m^2 + n^4)(m + n^2)(m - n^2)(n + 1)(n - 1)$

LESSON 8-6

Reteach

Choosing a Factoring Method

Use the following table to help you choose a factoring method.

First factor out a GCF if possible. Then,

If binomial,	check for difference of squares.	yes →	Use $(a + b)(a - b)$.
		no →	If no GCF, it cannot be factored.
If trinomial,	check for perfect square trinomial.	yes →	Factor using $(a + b)^2$ or $(a - b)^2$.
		no →	If $a = 1$, check factors of c that sum to b.
			If $a \neq 1$, check inner plus outer factors of a and c that sum to b.
If 4 or more terms,	→		Try to factor by grouping.

Explain how to choose a factoring method for $x^2 - x - 30$. Then state the method.

- There is no GCF.
- $x^2 - x - 30$ is a trinomial.
- The terms a and b are not perfect squares, therefore this is not a perfect square trinomial.
- $a = 1$

Method: Factor by checking factors of c that sum to b.

Explain how to choose a factoring method for $2x^2 - 50$. Then state the method.

- Factor out the GCF: $2(x^2 - 25)$
- $x^2 - 25$ is a binomial.
- a and b are perfect squares. This is a difference of squares.

Method: Factor out GCF. Then use $(a + b)(a - b)$.

Explain how to choose a factoring method for each polynomial. Then state the method.

1. $x^2 + 14x + 49$ — no GCF; $x^2 + 14x + 49$ is a trinomial; This is a perfect square trinomial. Method: use $(a + b)^2$.
2. $4x^2 - 40$ — factor out the GCF: $4(x^2 - 10)$; $x^2 - 10$ is a binomial; This is not a difference of squares. Method: Factor out GCF.
3. $2x^2 + 8x + 6$ — factor out the GCF: $2(x^2 + 4x + 3)$; $x^2 + 4x + 3$ is a trinomial; This is not a perfect square trinomial; $a = 1$; Method: Factor out GCF. Then find factors of c that sum to b.