

**Practice Factoring**

## 108 Chapter 3

8. Factor.

a)  $8m^3 - 4m^2$

b)  $8y^2 - 12y^4 + 24$

c)  $28a^2 - 7a^3$

d)  $6a^2b^3c - 15a^2b^2c^2$

e)  $30x^2y - 20x^2y^2 + 10x^3y^2$

f)  $8mn^2 - 12mn - 16m^2n$

9. Factor.

a)  $m^2 + 8m + 16$

b)  $a^2 - 7a + 12$

c)  $y^2 - 2y - 8$

d)  $n^2 - 4n - 45$

e)  $s^4 - (15s^2 + 54)$

f)  $k^4 - 9k^2 - 90$

10. Factor.

a)  $a^2 + 14ab + 24b^2$

b)  $m^2 + 9mn + 18n^2$

c)  $s^2 + 20st + 36t^2$

d)  $x^2 - xy - 20y^2$

e)  $c^2 + 21cd - 100d^2$

f)  $p^2 - 19pq - 120q^2$

11. Factor.

a)  $4x^2 - 7x + 3$

b)  $6a^2 - 13a - 5$

c)  $21n^2 + 8n - 4$

d)  $6r^2 - 31r + 5$

e)  $12t^2 - 15t - 18$

f)  $56x^2 + 18x - 8$

12. Factor.

a)  $b^2 - 36$

b)  $81k^4 - 1$

c)  $36x^2 - 49y^2$

d)  $4a^2 - 9b^2$

e)  $25m^2 - 81n^2$

f)  $1 - 16s^4$

g)  $196x^2 - 25z^2$

h)  $256p^2 - 625q^2$

i)  $289s^2 - 324t^2$

13. Factor.

a)  $8a^2 - 72$

b)  $150 - 6n^2$

c)  $7x^4 - 7y^4$

d)  $27m^3 - 12m$

e)  $\frac{a^2}{36} - \frac{b^2}{49}$

f)  $125p^2q^2 - 180q^2$

14. Factor.

a)  $(2c - 5)^2 - 121$

b)  $x^2 - (y + z)^2$

c)  $a^2 - (b - c)^2$

15. Factor.

a)  $-98m^3 + 32m$

b)  $125x^2y^2 - 180y^2$

c)  $128x^2y - 50y^3$

16. Factor.

a)  $x^4 - 29x^2y^2 + 100y^4$

b)  $m^4 - 38m^2n^2 + 72n^4$

**1 Factoring Polynomials**

1. Remove the common factor.

a)  $6x^2 + 15x - 12$

d)  $4x^2y + 6xy - 8xy^2$

b)  $14y^2 - 42y + 21$

e)  $3p^3q + 18p^2q^2 + 6pq^3$

2. Factor, if possible.

a)  $x^2 + 19x + 34$

d)  $15 - 8t + t^2$

g)  $5x^2 - 17x - 12$

j)  $3x^2 - 14xy + 8y^2$

m)  $(x + a)^2 + 6(x + a) + 8$

b)  $x^2 - 6x - 72$

e)  $4n^2 + 13n + 9$

h)  $15y^2 + 11y - 14$

k)  $15a^2 - ab - 6b^2$

n)  $(x - y)^2 - 5(x - y) + 6$

c)  $20x + 15x^2 + 10$

f)  $12a^3b^2 + 4a^2b^3 + 8ab^4 - 6b^5$

c)  $x^2 - 24x + 40$

f)  $2m^2 - 5m + 6$

i)  $x^2 + 7xy + 10y^2$

l)  $14x^2 + 55xy - 36y^2$

o)  $x^4 + 2x^2 - 15$

3. Factor completely.

a)  $3x^2 - 30x + 27$

d)  $2u^2 - 6uv + 4v^2$

g)  $4t^3 - 26t^2 - 14t$

b)  $4x^2 + 10x - 24$

e)  $36x^2 + 42xy - 18y^2$

h)  $30x^4 + 87x^2 + 30$

c)  $75y^2 + 215y + 40$

f)  $x^3 + 3x^2 + 2x$

i)  $24x^4 - 16x^2 - 8$

**2 Factoring Special Products**

1. Factor.

a)  $25x^2 + 60x + 36$

d)  $25 - 169x^2$

b)  $9y^2 - 30y + 25$

e)  $4x^2 - 9y^2$

c)  $9n^2 - 64$

f)  $49a^2 - 56ab + 16b^2$

2. Factor completely.

a)  $16m^2 - 64$

d)  $72x^2 - 98y^4$

g)  $32w^3 - 160w^2 + 200w$

b)  $36 - 16x^2$

e)  $2x^2 - 28x + 98$

h)  $300 - 48x^4$

c)  $125x^4 - 80$

f)  $12x^2 + 60x + 75$

i)  $36y^4 + 120x^2y^2 + 100x^4$

# ANS to Factoring Handout

Date: \_\_\_\_\_

Name: \_\_\_\_\_

## Practice Factoring

108 Chapter 3

8. Factor.

a)  $8m^3 - 4m^2$   $4m^2(2m-1)$

b)  $8y^2 - 12y^4 + 24$   $-4(3y^4 - 2y^2 - 6)$

c)  $28a^2 - 7a^3$   $7a^2(4-a)$

d)  $6a^2b^3c - 15a^2b^2c^2$   $3a^2b^2c(2b-5c)$

e)  $30x^2y - 20x^2y^2 + 10x^3y^2$   
 $10x^2y(3-2y+xy)$

f)  $8mn^2 - 12mn - 16m^2n$   
 $4mn(2n-3-4m)$

9. Factor.

a)  $m^2 + 8m + 16$   $(m+4)^2$     b)  $a^2 - 7a + 12$   $(a-3)(a-4)$     c)  $y^2 - 2y - 8$   $(y-4)(y+2)$

d)  $n^2 - 4n - 45$   $(n-9)(n+5)$     e)  $s^4 - 15s^2 + 54$   $(s+3)(s-3)(s^2-6)$     f)  $k^4 - 9k^2 - 90$   $(k^2-15)(k^2+6)$   
 $(s+3)(s-3)(s+6)(s-6)$

10. Factor.

a)  $a^2 + 14ab + 24b^2$   $(a+12b)(a+2b)$

b)  $m^2 + 9mn + 18n^2$   $(m+3n)(m+6n)$

c)  $s^2 + 20st + 36t^2$   $(s+2t)(s+18t)$

d)  $x^2 - xy - 20y^2$   $(x-5y)(x+4y)$

e)  $c^2 + 21cd - 100d^2$   $(c+25d)(c-4d)$

f)  $p^2 - 19pq - 120q^2$   $(p+5q)(p-24q)$

11. Factor.

a)  $4x^2 - 7x + 3$   $(4x-3)(x-1)$

b)  $6a^2 - 13a - 5$   $(2a-5)(3a+1)$

c)  $21n^2 + 8n - 4$   $(7n-2)(3n+2)$

d)  $6r^2 - 31r + 5$   $(6r-1)(r-5)$

e)  $12t^2 - 15t - 18$   $3(4t+3)(t-2)$

f)  $56x^2 + 18x - 8$   $2(7x+4)(4x-1)$

12. Factor.

a)  $b^2 - 36$   $(b+6)(b-6)$

b)  $81k^4 - 1$   $(3k+1)(3k-1)(9k^2+1)$

c)  $36x^2 - 49y^2$   $(6x+7y)(6x-7y)$

d)  $4a^2 - 9b^2$   $(2a+3b)(2a-3b)$

e)  $25m^2 - 81n^2$   $(5m+9n)(5m-9n)$

f)  $1 - 16s^4$   $(1+4s^2)(1+2s)(1-2s)$

g)  $196x^2 - 25z^2$   $(14x+5z)(14x-5z)$

h)  $256p^2 - 625q^2$   $(16p+25q)(16p-25q)$

i)  $289s^2 - 324t^2$   $(17s+18t)(17s-18t)$

13. Factor.

a)  $8a^2 - 72$   $8(a+3)(a-3)$

b)  $150 - 6n^2$   $6(5+n)(5-n)$

c)  $7x^4 - 7y^4$   $7(x^2+y^2)(x+ty)(x-y)$

d)  $27m^3 - 12m$   $3m(3m+2)(3m-2)$

e)  $\frac{a^2}{36} - \frac{b^2}{49}$   $(\frac{a}{6} + \frac{b}{7})(\frac{a}{6} - \frac{b}{7})$

f)  $125p^2q^2 - 180q^2$   $5q^2(5p+6)(5p-6)$

14. Factor.

a)  $(2c-5)^2 - 121$   $4(c-8)(c+3)$

b)  $x^2 - (y+z)^2$   $(x+y+z)(x-y-z)$

c)  $a^2 - (b-c)^2$   $(a+b-c)(a-b+c)$

15. Factor.

a)  $-98m^3 + 32m$   $-2m(7m+4)(7m-4)$

b)  $125x^2y^2 - 180y^2$   $5y^2(5x+6)(5x-6)$

c)  $128x^2y - 50y^3$   $2y(8x+5y)(8x-5y)$

16. Factor.

a)  $x^4 - 29x^2y^2 + 100y^4$   
 $(x^2-4y^2)(x^2-25y^2)$   
 $(x+2y)(x-2y)(x+5y)(x-5y)$

b)  $m^4 - 38m^2n^2 + 72n^4$   
 $(m^2-2n^2)(m^2-36n^2)$   
 $(m^2-2n^2)(m+6n)(m-6n)$

Date: \_\_\_\_\_

Name: \_\_\_\_\_

### 1 Factoring Polynomials

1. Remove the common factor.

- a)  $6x^2 + 15x - 12$   $3(a^2 - 5a - 4)$     b)  $14y^2 - 42y + 21$   $7(2y^2 - 6y + 3)$     c)  $20x + 15x^2 + 10$   $5(4x + 3x^2 + 2)$   
 d)  $4x^2y + 6xy - 8xy^2$   $2xy(2x + 3 - 4y)$     e)  $3p^3q + 18p^2q^2 + 6pq^3$   $3pq(p^2 + 6pq + 2q^2)$     f)  $12a^3b^2 + 4a^2b^3 + 8ab^4 - 6b^5$   $2b^2(6a^3 + 2a^2b + 4ab^2 - 3b^3)$

2. Factor, if possible.

- a)  $x^2 + 19x + 34$   $(x+2)(x+17)$     b)  $x^2 - 6x - 72$   $(x-12)(x+6)$     c)  $x^2 - 24x + 40$  not possible N/A  
 d)  $15 - 8t + t^2$   $(t-5)(t-3)$     e)  $4n^2 + 13n + 9$   $(4n+9)(n+1)$     f)  $2m^2 - 5m + 6$  N/A  
 g)  $5x^2 - 17x - 12$   $(5x+3)(x-4)$     h)  $15y^2 + 11y - 14$   $(5y+7)(3y-2)$     i)  $x^2 + 7xy + 10y^2$   $(x+2y)(x+5y)$   
 j)  $3x^2 - 14xy + 8y^2$   $(3x-2y)(x-4y)$     k)  $15a^2 - ab - 6b^2$   $(5a+3b)(3a-2b)$     l)  $14x^2 + 55xy - 36y^2$   $(7x-4y)(2x+9y)$   
 m)  $(x+a)^2 + 6(x+a) + 8$   $(x+a+2)(x+a+4)$     n)  $(x-y)^2 - 5(x-y) + 6$   $(x-y-2)(x-y-6)$     o)  $x^4 + 2x^2 - 15$   $(x^2+5)(x^2-3)$   
 3. Factor completely.

- a)  $3x^2 - 30x + 27$   $3(x-9)(x-1)$     b)  $4x^2 + 10x - 24$   $2(2x-3)(x+4)$     c)  $75y^2 + 215y + 40$   $5(5y+1)(3y+8)$   
 d)  $2u^2 - 6uv + 4v^2$   $2(u-4)(u-v)$     e)  $36x^2 + 42xy - 18y^2$   $6(3x-y)(2x+3y)$     f)  $x^3 + 3x^2 + 2x$   $x(x+2)(x+1)$   
 g)  $4t^3 - 26t^2 - 14t$   $2t(2t+1)(t-7)$     h)  $30x^4 + 87x^2 + 30$   $3(5x^2+2)(2x^2+5)$     i)  $24x^4 - 16x^2 - 8$   $8(3x^2+1)(x+1)(x-1)$

### 2 Factoring Special Products

1. Factor.

- a)  $25x^2 + 60x + 36$   $(5x+6)^2$     b)  $9y^2 - 30y + 25$   $(3y-5)^2$     c)  $9n^2 - 64$   $(3n+8)(3n-8)$   
 d)  $25 - 169x^2$   $(5+13x)(5-13x)$     e)  $4x^2 - 9y^2$   $(2x+3y)(2x-3y)$     f)  $49a^2 - 56ab + 16b^2$   $(7a-4b)^2$

2. Factor completely.

- a)  $16m^2 - 64$   $16(m+2)(m-2)$     b)  $36 - 16x^2$   $4(3+2x)(3-2x)$     c)  $125x^4 - 80$   $5(5x^2+4)(5x^2-4)$   
 d)  $72x^2 - 98y^4$   $2(6x+7y^2)(6x-7y^2)$     e)  $2x^2 - 28x + 98$   $2(x-7)^2$     f)  $12x^2 + 60x + 75$   $3(2x+5)^2$   
 g)  $32w^3 - 160w^2 + 200w$   $8w(2w-5)^2$     h)  $300 - 48x^4$   $12(5+2x^2)(5-2x^2)$     i)  $36y^4 + 120x^2y^2 + 100x^4$   $4(3y^2+5x^2)^2$