

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) $k^4 - 9k^2 - 90$ $(k^2-15)(k^2+6)$

10. Factor.

a) $a^2 + 14ab + 24b^2$
 $(a+2b)(a+6b)$

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) $7x^4 - 7y^4$
 $7(x^2+y^2)(x+iy)(x-iy)$

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) $6x^2 + 15x - 12$ $3(x^2 - 5x - 4)$ 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) $36y^4 + 120x^2y^2 + 100x^4$ $4(3y^2+5x^2)^2$