

**Section 1.2 – Practice Problems**

Factor using Grouping or the AC Method

1.  $2x^2 + 13x + 15$

$a \cdot b = 30$

$2x^2 + 10x + 3x + 15$

$a + b = 13$

$2x(x+5) + 3(x+5)$   
Factor out

$(2x+3)(x+5)$

2.  $3x^2 + 8x + 4$

$a \cdot b = 12$

$a + b = 8$

$3x^2 + 6x + 2x + 4$

$3x(x+2) + 2(x+2)$

$(3x+2)(x+2)$

\*C

3.  $10x^2 + 17x + 3$

$x^2 + 17x + 30$

$(x + \frac{15}{10})(x + \frac{2}{10})$

$(x + \frac{3}{2})(x + \frac{1}{5})$

$(2x+3)(5x+1)$

4.  $8y^2 - 18y + 9$

$y^2 - 18y + 72$

$(y - \frac{12}{8})(y - \frac{6}{8})$

$(y - \frac{3}{2})(y - \frac{3}{4})$

$(2y-3)(4y-3)$

5.  $21y^2 - 41y + 10$

$a \cdot b = 210$

$21y^2 - 35y - 6y + 10$

$a + b = -41$

$7y(3y-5) - 2(3y-5)$

$21 \cdot 10$   
 $3 \cdot 7 \cdot 2 \cdot 5$

$(7y-2)(3y-5)$

6.  $2y^2 - 7y + 5$

$a \cdot b = 10$

$a + b = -7$

$2y^2 - 2y - 5y + 5$

$2y(y-1) - 5(y-1)$

$(2y-5)(y-1)$

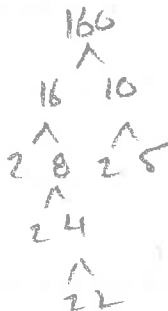
7.  $20z^2 - 27z - 8$

$a \cdot b = -160$   
 $a + b = -27$

$20z^2 - 32z + 5z - 8$

$4z(5z - 8) + 1(5z - 8)$

$(4z + 1)(5z - 8)$



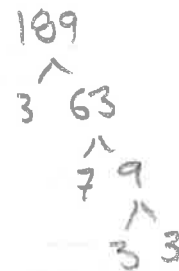
8.  $3z^2 - 20z - 63$

$a \cdot b = 189$   
 $a + b = -20$

$3z^2 - 27z + 7z - 63$

$3z(z - 9) + 7(z - 9)$

$(3z + 7)(z - 9)$



Factor Completely

9.  $-3x^2 - x + 4$

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

$a \cdot b = -12$   
 $a + b = 1$

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

$(-1)[x(3x + 4) - 1(3x + 4)]$

$(-1)[(3x + 4)(x - 1)]$

10.  $-2x^2 - 5xy - 2y^2$

$a \cdot b = 4$   
 $a + b = 5$

$(-1)(2x^2 + 5xy + 2y^2)$

$(-1)[2x^2 + 4xy + xy + 2y^2]$

$(-1)[2x(x + 2y) + y(x + 2y)]$

$(-1)[(2x + y)(x + 2y)]$

11.  $-6a^2 - 17ab + 3b^2$

$(-1)[6a^2 + 17ab - 3b^2]$

$a \cdot b = 18$   
 $a + b = 17$

$(-1)[6a^2 + 18ab - 1ab - 3b^2]$

$(-1)[6a(a + 3b) - b(a + 3b)]$

$(-1)[(6a - b)(a + 3b)]$

12.  $-4a^2b - 4ab^2 + 3b^3$

$-b[4a^2 + 4ab - 3b^2]$

$a \cdot b = -12$   
 $a + b = 4$

$-b[4a^2 + 6ab - 2ab - 3b^2]$

$-b[2a(2a + 3b) - b(2a + 3b)]$

$-b[(2a - b)(2a + 3b)]$

Factor Completely let  $(a-1)^3 = z$

13.  $25x^2(a-1)^3 - 5x(a-1)^3 - 2(a-1)^3$

$25x^2z - 5xz - 2z$  factor  $z$

$z[25x^2 - 5x - 2]$

$a \cdot b = 50$   
 $a + b = -5$

$z[25x^2 - 10x + 5x - 2]$

$z[5x(5x-2) + 1(5x-2)]$

$z[(5x+1)(5x-2)]$  sub back  $z$

$(a-1)^3[(5x+1)(5x-2)]$

14.  $9 - 10x^2 + x^4$

reorder to descending order

$x^4 - 10x^2 + 9$

let  $x^2 = y$

$y^2 - 10y + 9$

$(y-1)(y-9)$

sub back in for  $y$

$(x^2-1)(x^2-9)$

both diff of squares

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

15.  $8x^4 + 19x^2 - 27$

let  $x^2 = x$

$8x^2 + 19x - 27$

$a \cdot b = 216$

$8x^2 + 27x - 8x - 27$

$a + b = 19$

$x(8x+27) - 1(8x+27)$

$216$   
 $\wedge$   
 $3 \quad 72$

$(x-1)(8x+27)$

$8 \quad 9$   
 $\wedge$   
 $3 \quad 3$

sub back in for  $x$  to  $x^2$

$(x^2-1)(8x+27)$

Diff of Squares

$(x+1)(x-1)(8x+27)$

16.  $9x^4 - 145x^2 + 16$

let  $x^2 = x$

$9x^2 - 145x + 16$

$a \cdot b = 144$

$9x^2 - 144x - x + 16$

$a + b = -145$

$9x(x-16) - 1(x-16)$

$(9x-1)(x-16)$

sub back in

$(9x^2-1)(x^2-16)$

Diff of squares

$(3x-1)(3x+1)(x-4)(x+4)$

**Answer Key – Section 1.2**

1.  $(x + 5)(2x + 3)$
2.  $(x + 2)(3x + 2)$
3.  $(2x + 3)(5x + 1)$
4.  $(2y - 3)(4y - 3)$
5.  $(3y - 5)(7y - 2)$
6.  $(y - 1)(2y - 5)$
7.  $(5z - 8)(4z + 1)$
8.  $(z - 9)(3z + 7)$
9.  $-(3x + 4)(x - 1)$
10.  $-(x + 2y)(2x + y)$
11.  $-(a + 3b)(6a - b)$
12.  $-b(2a + 3b)(2a - b)$
13.  $(a - 1)^3(5x - 2)(5x + 1)$
14.  $(x + 3)(x - 3)(x + 1)(x - 1)$
15.  $(8x^2 + 27)(x + 1)(x - 1)$
16.  $(x + 4)(x - 4)(3x - 1)(3x + 1)$