

1.1 Factor the following completely:

1.  $2x^2 - 5x$

$2x^2 - 5x = x(2x - 5)$

2.  $x^2 + 2x + 1$

$(x^2 + 2x + 1) = (x + 1)^2$   
 $x^2 + 2x + 1 = (x + 1)(x + 1)$

3.  $3x^2 - 12$

$3x^2 - 12 = 3(x^2 - 4)$   
 $3(x^2 - 4) = 3(x + 2)(x - 2)$

1.2 Factor the following quadratics by grouping:

1.  $2x^2 + 7x + 3$

$2x^2 + 7x + 3 = 2x^2 + 4x + 3x + 3$   
 $= 2x(x + 2) + 3(x + 1)$   
 $= (2x + 3)(x + 1)$

2.  $x^2 - 5x + 6$

$x^2 - 5x + 6 = x^2 - 2x - 3x + 6$   
 $= x(x - 2) - 3(x - 2)$   
 $= (x - 2)(x - 3)$

3.  $x^2 + 10x + 24$

$x^2 + 10x + 24 = x^2 + 6x + 4x + 24$   
 $= x(x + 6) + 4(x + 6)$   
 $= (x + 6)(x + 4)$

4.  $x^2 - 7x + 12$

$x^2 - 7x + 12 = x^2 - 4x - 3x + 12$   
 $= x(x - 4) - 3(x - 4)$   
 $= (x - 4)(x - 3)$

1.3 Identify the factors of each equation and write the corresponding:

1.  $x^2 - 16 = 0$

Factor:  $(x + 4)(x - 4)$   
 Roots:  $x = -4, x = 4$

2.  $x^2 + 10x + 24 = 0$

Factor:  $(x + 6)(x + 4)$   
 Roots:  $x = -6, x = -4$

3.  $x^2 - 7x + 12 = 0$

Factor:  $(x - 4)(x - 3)$   
 Roots:  $x = 4, x = 3$

4.  $x^2 - 5x + 6 = 0$

Factor:  $(x - 2)(x - 3)$   
 Roots:  $x = 2, x = 3$