

Factor:

① Special Products Difference of Two Squares

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

Ex:  $x^2 - 9 = (x+3)(x-3)$   
 $x^2 + 0x - 9$

a.  $x^2 - 25 = (x+5)(x-5)$

b.  $x^2 - 49 = (x+7)(x-7)$

c.  $x^2 - 36 = (x+6)(x-6)$

d.  $4x^2 - 1 = (2x+1)(2x-1)$

e.  $25x^2 - 16 = (5x+4)(5x-4)$   
 $25x^2 - 20x + 20x - 16$

f.  $81x^4 - 16 = (9x^2+4)(9x^2-4)$   
 $(9x^2+4)(3x+2)(3x-2)$

Perfect Square Trinomial

$$a^2 + 2ab + b^2 = (a+b)^2$$

Ex:  $x^2 + 10x + 25 = (x+5)(x+5) = (x+5)^2$   
 $\begin{matrix} \boxed{x^2} & + & 10x & + & 25 \\ \text{PS} & & \downarrow & & \downarrow \\ x & - & 5x & - & 5 \end{matrix}$

a.  $x^2 - 14x + 49 = (x-7)^2$

b.  $9x^2 + 60x + 100 = (3x+10)^2$   
 $\begin{matrix} 9x^2 & + & 60x & + & 100 \\ 3x & & 20x & & 10 \end{matrix}$

c.  $64x^2 - 16x + 1 = (8x-1)^2$   
 $\begin{matrix} 64x^2 & - & 16x & + & 1 \\ 8x & & -4x & & -1 \end{matrix}$

d.  $4x^2 + 72x + 81$   
 $\begin{matrix} 4x^2 & + & 72x & + & 81 \\ 2x & & 18x & & 9 \end{matrix}$   
 $4x^2 + 36x + 81 = (2x+9)^2$

e.  $9x^2 - 42x + 49 = (3x-7)^2$   
 $\begin{matrix} 9x^2 & - & 42x & + & 49 \\ 3x & & -14x & & -7 \end{matrix}$

Factoring Trinomials

a.  $x^2 - 7x - 18 = (x+2)(x-9)$   
 $\begin{matrix} 18 \\ 3 \cdot 6 \end{matrix}$

b.  $x^2 + 9x + 18 = (x+3)(x+6)$   
 $\begin{matrix} 18 \\ 3 \cdot 6 \end{matrix}$

c.  $x^2 - 15x + 50 = (x-10)(x-5)$

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

e.  $x^2 - x - 20 = (x-5)(x+4)$

f.  $3x^2 - 5x - 28 =$   
 $\begin{matrix} -84 \\ 1 \cdot 84 \\ 2 \cdot 42 \\ 3 \cdot 28 \\ 4 \cdot 21 \\ 6 \cdot 14 \end{matrix}$   $\text{7:28} = 5$

$3x^2 + 7x - 12x - 28$

$x(3x+7) - 4(3x+7)$

$(x-4)(3x+7)$

p. 455  
 (18-38) all