


## 3.8 Factoring Quadratic Expressions

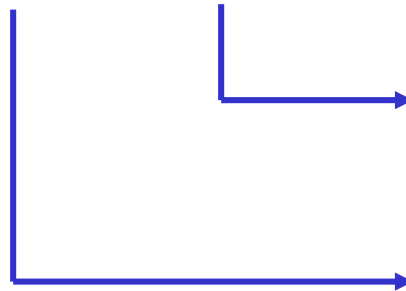
Expand:  $(x + 4)(x + 6)$  

$$= x^2 + 6x + 4x + 24$$

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

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Factor:  $x^2 + 10x + 24$



The product of  
numbers is 24

The sum of  
numbers is 10

$$= (x + 4)(x + 6)$$

4 and 6

## Example 1:

**Factor:**  $x^2 - 8x + 12$

product is 12  
sum is  $-8$

$= (x - 6)(x - 2)$        $-6$  and  $-2$

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## Example 2:

**Factor:**  $a^2 - 5a - 24$

product is  $-24$   
sum is  $-5$

$= (a - 8)(a + 3)$        $-8$  and  $3$

### Example 3:

Factor:  $s^2 - 8s - 20$

product is  $-20$   
sum is  $-8$   
 $-10$  and  $2$

$$= (s - 10)(s + 2)$$

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### Example 4:

Factor:  $w^2 - w - 30$

product is  $-30$   
sum is  $-1$   
 $-6$  and  $5$

$$= (w - 6)(w + 5)$$

Example 5:  $4x^2 - 24x + 36$

On 1<sup>st</sup> glance it seems not to be a simple trinomial.

Can we begin by taking a common factor?    yes

$$4x^2 - 24x + 36 = 4(x^2 - 6x + 9)$$

product is 9  
sum is -6

$$= 4(x - 3)(x - 3) \quad -3 \text{ and } -3$$

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