

**Intermediate Algebra**  
**Skill Builder # PF - 4**  
**Factoring Quadratic Trinomials with Leading Coefficient of 1**

A quadratic trinomial with leading coefficient of 1 looks like

$$x^2 + bx + c.$$

To factor such a trinomial find two numbers that multiply to the constant term  $c$  and that add up to the middle coefficient  $b$ .

Examples

1.  $x^2 + 15x + 56$

Solution:

A large 'X' is drawn. The top-left branch contains '+15', the top-right branch contains '8', the bottom-left branch contains '7', and the bottom-right branch contains '56' with a dot above it.

$\Rightarrow$  the factored form of  $x^2 + 15x + 56$  is  $(x+7)(x+8)$

2.  $x^2 - 13x + 40$

A large 'X' is drawn. The top-left branch contains '+', the top-right branch contains '-13', the bottom-left branch contains '-5', and the bottom-right branch contains '-8' with a dot above it.

$\Rightarrow$  the factored form of  $x^2 - 13x + 40$  is  $(x-5)(x-8)$

3.  $y^2 + 9y - 52$

A large 'X' is drawn. The top-left branch contains '+', the top-right branch contains '9', the bottom-left branch contains '13', and the bottom-right branch contains '-4' with a dot above it.

$\Rightarrow$  the factored form of  $y^2 + 9y - 52$  is  $(y+13)(y-4)$

4.  $n^2 - 14n - 120$

A large 'X' is drawn. The top-left branch contains '+', the top-right branch contains '-14', the bottom-left branch contains '-20', and the bottom-right branch contains '6' with a dot above it.

$\Rightarrow$  the factored form of  $n^2 - 14n - 120$  is  $(n-20)(n+6)$

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Factor the given quadratic trinomial.

1.  $x^2 + 11x + 28$

2.  $x^2 - 17x - 60$

3.  $y^2 + 8y - 48$

4.  $y^2 - 16y + 64$

5.  $n^2 - 13n - 140$

6.  $n^2 + 7n - 78$

7.  $t^2 + 20t + 99$

8.  $t^2 - 30t + 225$

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**Answers**

1.  $(x+4)(x+7)$

2.  $(x-20)(x+3)$

3.  $(y+12)(y-4)$

4.  $(y-8)(y-8)$

5.  $(n-20)(n+7)$

6.  $(n+13)(n-6)$

7.  $(t+11)(t+9)$

8.  $(t-15)(t-15)$

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