

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 diagram for factoring by splitting the middle term. Two diagonal lines intersect. The top-left segment is labeled '7', the top-right segment is labeled '8', and the bottom segment is labeled '56'. A '+' sign is above the intersection and a '•' sign is below it.

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

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

A diagram for factoring by splitting the middle term. Two diagonal lines intersect. The top-left segment is labeled '-5', the top-right segment is labeled '-8', and the bottom segment is labeled '-40'. A '+' sign is above the intersection and a '•' sign is below it.

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

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

A diagram for factoring by splitting the middle term. Two diagonal lines intersect. The top-left segment is labeled '13', the top-right segment is labeled '-4', and the bottom segment is labeled '-52'. A '+' sign is above the intersection and a '•' sign is below it.

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

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

A diagram for factoring by splitting the middle term. Two diagonal lines intersect. The top-left segment is labeled '-20', the top-right segment is labeled '6', and the bottom segment is labeled '-120'. A '+' sign is above the intersection and a '•' sign is below it.

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

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Factoring Quadratic Trinomials with Leading Coefficient of 1

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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Factoring Quadratic Trinomials with Leading Coefficient of 1

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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