

5.13

Factoring a Quadratic Trinomial with Leading Coefficient 1

• Example 1

Factor the quadratic expression

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

Suppose that, for some integers m and n ,

$$x^2 - 7x + 12 = (x - m)(x - n) = x^2 - (m + n)x + mn$$

Thus, $m + n = 7$ and $mn = 12$. The only possible values for m and n are $m = 3$ and $n = 4$ (or, equivalently $m = 4$ and $n = 3$).

We obtain

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

Warning. THIS METHOD DOES NOT ALWAYS WORK AND IS PRACTICAL ONLY IF m AND n ARE INTEGERS.

● ● ● CHECK YOURSELF 1

Factor.

$$x^2 - 4x - 21$$

● ● ● CHECK YOURSELF ANSWER

1. $(x - 7)(x + 3)$.

5.13 Exercises

Name _____

Section _____

Date _____

A N S W E R S

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Factor.

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|----------------------|----------------------|
| 1. $x^2 + 8x + 15$ | 2. $x^2 - 11x + 24$ |
| 3. $x^2 - 11x + 28$ | 4. $y^2 - y - 20$ |
| 5. $s^2 + 13s + 30$ | 6. $b^2 + 14b + 33$ |
| 7. $a^2 - 2a - 48$ | 8. $x^2 - 17x + 60$ |
| 9. $x^2 - 8x + 7$ | 10. $x^2 + 7x - 18$ |
| 11. $x^2 - 6x - 40$ | 12. $x^2 - 11x + 10$ |
| 13. $x^2 - 14x + 49$ | 14. $s^2 - 4s - 32$ |
| 15. $p^2 - 10p - 24$ | 16. $x^2 - 11x - 60$ |
| 17. $x^2 + 5x - 66$ | 18. $a^2 + 2a - 80$ |
| 19. $c^2 + 19c + 60$ | 20. $t^2 - 4t - 60$ |