## 5.6 Factoring Trinomials: $x^2 + bx + c$
MATHPOWER™ *Nine*, pp. 195–197

To factor a trinomial in the form $x^2 + bx + c$, use the following steps.
**a)** List all the factors of $c$.
**b)** From the list, select the pair of factors whose sum is $b$.

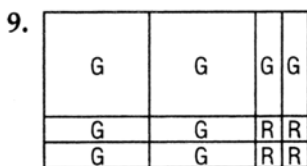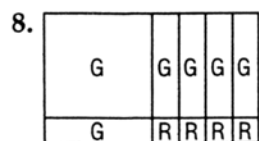Factor $x^2 + 5x + 6$.    Find $m$ and $n$ so that $m + n = 5$ and $mn = 6$.

| Pair of Factors | Sum of Pair of Factors |
|---|---|
| 1, 6 | 7 |
| −1, −6 | −7 |
| 2, 3 | 5 |
| −2, −3 | −5 |

Therefore, $m = 2$ and $n = 3$.
$x^2 + 5x + 6 = (x + 2)(x + 3)$

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*Complete the table.*

| | Product | Pair of Factors | Sum of Pair of Factors |
|---|---|---|---|
| **1.** | 15 | | 8 |
| **2.** | −12 | | 1 |
| **3.** | −6 | | −1 |
| **4.** | 4 | | −4 |
| **5.** | | 1, 5 | |
| **6.** | | −2, 3 | |
| **7.** | | −2, −7 | |

*Express the area of each rectangle in expanded and factored form. Let G represent green tiles and R represent red tiles.*

**8.**


**9.**


_____    _____

_____    _____

*Factor.*

**10.** $a^2 - 5a + 6$    **11.** $s^2 - 4s - 12$

_____    _____

**12.** $c^2 - 2c - 24$    **13.** $y^2 + y - 42$

_____    _____

**14.** $q^2 + 16q + 64$    **15.** $m^2 - 8m + 15$

_____    _____

*Remove the GCF and factor fully.*

**16.** $2x^2 + 12x + 10$    **17.** $5z^2 - 10z - 40$

_____    _____

**18.** $4n^2 - 16n - 20$    **19.** $3y^2 - 12y + 12$

_____    _____

*Factor, if possible.*

**20.** $x^2 + 8x + 15$    **21.** $y^2 + 12y + 30$

_____    _____

**22.** $t^2 - 4t + 32$    **23.** $z^2 + z + 56$

_____    _____

*Fill in the missing terms.*

**24.** $x^2 + \square x + 30 = (x + \square)(x + \square)$

**25.** $x^2 - \square x + 30 = (x - \square)(x - \square)$

**26.** $x^2 + 6x + \square = (x + \square)(x + \square)$

**27.** $x^2 - 6x + \square = (x - \square)(x - \square)$

**28.** A field has an area of $(x^2 + x - 6)$ square metres. State expressions for its length and width.

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