

5.3

Multiplication of Two Binomials

• Example 1

(a) Multiply $x + 2$ by $x + 3$.

We can think of $x + 2$ as a single quantity and apply the distributive property.

$$\begin{aligned}
 & \overbrace{(x + 2)(x + 3)} \qquad \text{Multiply } x + 2 \text{ by } x \text{ and then by } 3. \\
 & = (x + 2)x + (x + 2)3 \\
 & = x \cdot x + 2 \cdot x + x \cdot 3 + 2 \cdot 3 \\
 & = x^2 + 2x + 3x + 6 \\
 & = x^2 + 5x + 6
 \end{aligned}$$

Note that this ensures that each term, x and 2 , of the first binomial is multiplied by each term, x and 3 , of the second binomial.

(b) Multiply $a - 3$ by $a - 4$. (Think of $a - 3$ as a single quantity and distribute.)

$$\begin{aligned}
 & (a - 3)(a - 4) \\
 & = (a - 3)a - (a - 3) \cdot 4 \\
 & = a \cdot a - 3 \cdot a - [(a \cdot 4) - (3 \cdot 4)] \\
 & = a^2 - 3a - (4a - 12) \\
 & = a^2 - 3a - 4a + 12 \\
 & = a^2 - 7a + 12
 \end{aligned}$$

● ● ● CHECK YOURSELF 1

Multiply.

a. $(x + 4)(x + 5)$

b. $(y + 5)(y - 6)$

● ● ● CHECK YOURSELF ANSWER

1. (a) $x^2 + 9x + 20$; (b) $y^2 - y - 30$.

5.3 Exercises

Name _____

Section _____

Date _____

A N S W E R S

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Multiply.

1. $(x + 3)(x + 2)$
2. $(a - 3)(a - 7)$
3. $(m - 5)(m - 9)$
4. $(b + 7)(b + 5)$
5. $(p - 8)(p + 7)$
6. $(x - 10)(x + 9)$
7. $(w + 10)(w + 20)$
8. $(s - 12)(s - 8)$
9. $(3x - 5)(x - 8)$
10. $(w + 5)(4w - 7)$
11. $(2x - 3)(3x + 4)$
12. $(5a + 1)(3a + 7)$
13. $(3a - b)(4a - 9b)$
14. $(7s - 3t)(3s + 8t)$
15. $(3p - 4q)(7p + 5q)$
16. $(5x - 4y)(2x - y)$
17. $(x - 5)(x + 5)$
18. $(y + 9)(y - 9)$
19. $(2m + 3)(2m - 3)$
20. $(3r - 7)(3r + 7)$