

4.4 Special Products

Solutions

Multiply and simplify where possible.

$$\begin{aligned}
 1. \quad & (x+5)^2 \\
 &= (x+5)(x+5) \\
 &= x^2 + 5x + 5x + 25 \\
 &= \boxed{x^2 + 10x + 25}
 \end{aligned}$$

	x	5
x	x^2	$5x$
5	$5x$	25

$$2. \quad (a+4)^2$$

$$\begin{aligned}
 3. \quad & (x-3)^2 \\
 &= (x-3)(x-3) \\
 &= x^2 - 3x - 3x + 9 \\
 &= \boxed{x^2 - 6x + 9}
 \end{aligned}$$

	x	-3
x	x^2	$-3x$
-3	$-3x$	9

$$4. \quad (x-6)^2$$

$$\begin{aligned}
 5. \quad & (3x+2)^2 \\
 &= (3x+2)(3x+2) \\
 &= 9x^2 + 6x + 6x + 4 \\
 &= \boxed{9x^2 + 12x + 4}
 \end{aligned}$$

	$3x$	2
$3x$	$9x^2$	$6x$
2	$6x$	4

$$6. \quad (4x+1)^2$$

$$\begin{aligned}
 7. \quad & (5x-3)^2 \\
 &= (5x-3)(5x-3) \\
 &= 25x^2 - 15x - 15x + 9 \\
 &= \boxed{25x^2 - 30x + 9}
 \end{aligned}$$

	$5x$	-3
$5x$	$25x^2$	$-15x$
-3	$-15x$	9

$$8. \quad (6x-5)^2$$

Answers: 1. $x^2 + 10x + 25$; 3. $x^2 - 6x + 9$; 5. $9x^2 + 12x + 4$; 7. $25x^2 - 30x + 9$

Multiply and simplify where possible.

$$\begin{aligned} 9. \quad & (x + 3)(x - 3) \\ & = x^2 + 3x - 3x - 9 \\ = & \boxed{x^2 - 9} \end{aligned}$$

	x	3
x	x^2	$3x$
-3	$-3x$	-9

$$10. \quad (x + 5)(x - 5)$$

$$\begin{aligned} 11. \quad & (5x + 2)(5x - 2) \\ & = 25x^2 + 10x - 10x - 4 \\ = & \boxed{25x^2 - 4} \end{aligned}$$

	$5x$	2
$5x$	$25x^2$	$10x$
-2	$-10x$	-4

$$12. \quad (3x + 4)(3x - 4)$$

$$\begin{aligned} 13. \quad & (2x + 3y)(2x - 3y) \\ & = 4x^2 + 6x - 6x - 9y^2 \\ = & \boxed{4x^2 - 9y^2} \end{aligned}$$

	$2x$	$3y$
$2x$	$4x^2$	$6xy$
$-3y$	$-6xy$	$-9y^2$

$$14. \quad (5x + 3y)(5x - 3y)$$

Answers: 9. $x^2 - 9$; 11. $25x^2 - 4$; 13. $4x^2 - 9y^2$