

4.3 Multiplying Polynomials

Solutions

Multiply and simplify where possible.	
1. $(7x)(5x) = 7 \cdot 5 \cdot x \cdot x = 35x^2$	2. $(8x)(2x)$
3. $(4x^3)(-3x^2)$ $= 4 \cdot (-3) \cdot x^3 \cdot x^2$ $= -12x^{3+2}$ $= -12x^5$	4. $(-8x^2)(2x^5)$
5. $2(3x - 5)$ $= 2 \cdot 3x - 2 \cdot 5$ $= 6x - 10$	6. $5(2a + 4)$
7. $2x^2(3x^3 - 4x)$ $= 2x^2 \cdot 3x^3 - 2x^2 \cdot 4x$ $= 6x^5 - 8x^3$	8. $3a(4a^2 + 5a^3)$
9. $2x(5x^2 - 4x + 7)$ $= 2x \cdot 5x^2 - 2x \cdot 4x + 2x \cdot 7$ $= 10x^3 - 8x^2 + 14x$	10. $-5a(a^2 - 2a + 1)$
Answers: 1. $35x^2$; 3. $-12x^5$; 5. $6x - 10$; 7. $6x^5 - 8x^3$; 9. $10x^3 - 8x^2 + 14x$	

Multiply and simplify where possible.

$$\begin{aligned}
 11. & (x + 8)(x + 3) \\
 & = x^2 + 8x + 3x + 24 \\
 & = \boxed{x^2 + 11x + 24}
 \end{aligned}$$

	x	8
x	x^2	$8x$
3	$3x$	24

$$12. (x + 2)(x + 1)$$

$$\begin{aligned}
 13. & (3x + 8)(x - 2) \\
 & = 3x^2 + 8x - 6x - 16 \\
 & = \boxed{3x^2 + 2x - 16}
 \end{aligned}$$

	$3x$	8
x	$3x^2$	$8x$
-2	$-6x$	-16

$$14. (4x + 3)(x - 3)$$

$$\begin{aligned}
 15. & (x - 1)(2x + 3) \\
 & = 2x^2 - 2x + 3x - 3 \\
 & = \boxed{2x^2 + x - 3}
 \end{aligned}$$

	x	-1
$2x$	$2x^2$	$-2x$
3	$3x$	-3

$$16. (x - 4)(3x + 5)$$

$$\begin{aligned}
 17. & (7x - 1)(2x - 3) \\
 & = 14x^2 - 2x - 21x + 3 \\
 & = \boxed{14x^2 - 23x + 3}
 \end{aligned}$$

	$7x$	-1
$2x$	$14x^2$	$-2x$
-3	$-21x$	3

$$18. (5x - 2)(2x - 1)$$

Answers: 11. $x^2 + 11x + 24$; 13. $3x^2 + 2x - 16$; 15. $2x^2 + x - 3$; 17. $14x^2 - 23x + 3$

Multiply and simplify where possible.

19. $(x + 8)(x - 8)$
 $= x^2 + 8x - 8x - 64$
 $= \boxed{x^2 - 64}$

	x	8
x	x^2	$8x$
-8	$-8x$	-64

20. $(x - 2)(x + 2)$

21. $(x^2 - 1)(x^2 - 1)$
 $= x^4 - x^2 - x^2 + 1$
 $= \boxed{x^4 - 2x^2 + 1}$

	x^2	-1
x^2	x^4	$-x^2$
-1	$-x^2$	1

22. $(3x^2 + 1)(3x^2 + 1)$

23. $(3x + 8)^2$
 $= (3x + 8)(3x + 8)$
 $= 9x^2 + 24x + 24x + 64$
 $= \boxed{9x^2 + 48x + 64}$

	$3x$	8
$3x$	$9x^2$	$24x$
8	$24x$	64

24. $(4x - 3)^2$

25. $(x - 1)(5x^2 + 2x - 3)$
 $= 5x^3 - 5x^2 + 2x^2 - 2x - 3x + 3$
 $= \boxed{5x^3 - 3x^2 - 5x + 3}$

	$5x^2$	$2x$	-3
x	$5x^3$	$2x^2$	$-3x$
-1	$-5x^2$	$-2x$	3

26. $(x + 2)(3x^2 - 2x - 1)$

Answers: 19. $x^2 - 64$; 21. $x^4 - 2x^2 + 1$; 23. $9x^2 + 48x + 64$; 25. $5x^3 - 3x^2 - 5x + 3$

Multiply and simplify where possible.

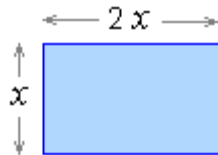
$$\begin{aligned}
 27. \quad & (5x + 1)(2x^2 - 3x - 5) \\
 & = 10x^3 + 2x^2 - 15x^2 - 3x - 25x - 5 \\
 & = \boxed{10x^3 - 13x^2 - 28x - 5}
 \end{aligned}$$

	$2x^2$	$-3x$	-5
$5x$	$10x^3$	$-15x^2$	$-25x$
1	$2x^2$	$-3x$	-5

$$28. \quad (8x + 3)(2x^2 + x - 1)$$

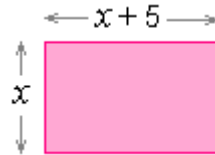
Write an expression for the area of each rectangle below.

29.

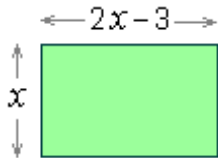


$$\text{Area} = x \cdot 2x = \boxed{2x^2 \text{ square units}}$$

30.

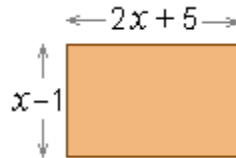


31.



$$\text{Area} = x \cdot (2x - 3) = \boxed{2x^2 - 3x \text{ square units}}$$

32.



Answers: 27. $10x^3 - 13x^2 - 28x - 5$; 29. $2x^2$; 31. $2x^2 - 3x$