7.2 Start Thinking

Complete the table.

Expression	x	Answer
$(x - 2)(x - 2)$	7	
$x(x - 2) - 2(x - 2)$	7	
$(z + 4)(z - 4)$	7	
$z(z - 4) + 4(z - 4)$	7	

What do you notice about the answers for the first two expressions and the last two expressions? How are the first two expressons related to one another? Are the last two expressions related in the same way?

7.2 Warm Up

Simplify.

1. $(6 + 2b)8$

2. $2(6x - 3)$

3. $(-4x + 7)4$

4. $-2(y^3 + 6)$

5. $-\frac{3}{2}(8x + 16y)$

6. $4(x - 3x + 5)$

7.2 Cumulative Review Warm Up

Determine whether the table represents a *linear* or an *exponential* function. Explain.

1.

x	2	3	4	5	6
y	−3	−2	−1	0	1

2.

x	0	1	2	3	4
y	0.125	1	8	64	512

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7.2 Practice A

In Exercises 1–3, use the Distributive Property to find the product.

1. $(x + 4)(x + 5)$ **2.** $(x + 1)(x - 6)$ **3.** $(x - 2)(x - 7)$

In Exercises 4–6, use a table to find the product.

4. $(y + 4)(y + 2)$ **5.** $(q + 4)(q - 7)$ **6.** $(2x - 3)(x - 1)$

7. Describe and correct the error in finding the product of the binomials.
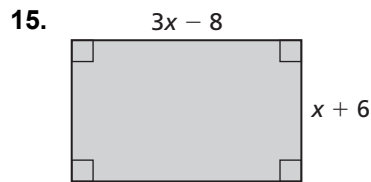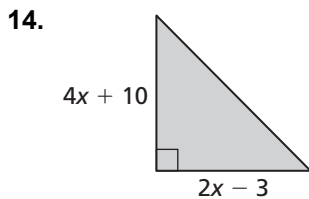
$\times$ $(x - 2)(5 - x)$

	x	5
x	x^2	$5x$
-2	$-2x$	-10

$(x - 2)(5 - x) = x^2 + 3x - 10$

In Exercises 8–13, use the FOIL Method to find the product.

8. $(u + 2)(u + 9)$ **9.** $(w + 6)(w - 5)$ **10.** $(m - 1)(m + 8)$

11. $(y - 6)(y - 3)$ **12.** $\left(q + \frac{1}{2}\right)\left(q - \frac{3}{2}\right)$ **13.** $(2 - 5t)(7 - t)$

In Exercises 14 and 15, write a polynomial that represents the area of the shaded region.

14.

$4x + 10$

$2x - 3$

15. $3x - 8$

$x + 6$

In Exercises 16–18, find the product.

16. $(x + 2)(x^2 + 5x + 1)$ **17.** $(y + 5)(y^2 + 2y - 6)$ **18.** $(h - 7)(h^2 - 3h + 2)$

19. When multiplying a binomial by a trinomial, is the degree of the product always 5? Explain.

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7.2 Practice B

In Exercises 1–3, use the Distributive Property to find the product.

1. $(p - 5)(p - 8)$

2. $(5t + 1)(t - 2)$

3. $(4v - 3)(v + 7)$

In Exercises 4–6, use a table to find the product.

4. $(2p + 4)(5p - 1)$

5. $(-4 + 3r)(7r - 2)$

6. $(4t - 9)(-6 + 2t)$

7. Describe and correct the error in finding the product of the binomials.
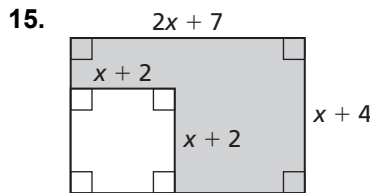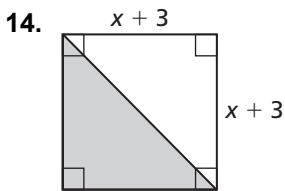
$\times$ $(x - 2)(5 - x)$

	5	$-x$
x	$5x$	$-x^2$
-2	-10	$2x$

$(x - 2)(5 - x) = 4x^2 + 2x - 10$

In Exercises 8–13, use the FOIL Method to find the product.

8. $(z + 9)(z - 8)$

9. $\left(m - \frac{2}{5}\right)\left(m + \frac{4}{5}\right)$

10. $(4 - x)(8 - 3x)$

11. $(9 - 6g)(2g + 3)$

12. $(p + 4)(p^2 + 7p)$

13. $(d - 2)(d^2 - 5d)$

In Exercises 14 and 15, write a polynomial that represents the area of the shaded region.

14.

$x + 3$

$x + 3$

15.

$2x + 7$

$x + 2$

$x + 2$

$x + 4$

In Exercises 16–18, find the product.

16. $(x + 10)(3x^2 + 5x - 2)$

17. $(2t^2 - 9t - 5)(3t + 7)$

18. $(3r^2 + 3r - 8)(5 - 2r)$

19. Write two polynomials that are not monomials, whose product is a trinomial of degree 4.

7.2 Enrichment and Extension

Perimeter and Area

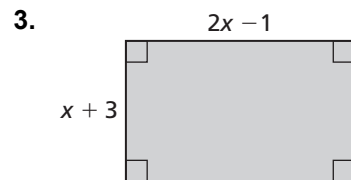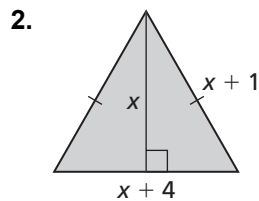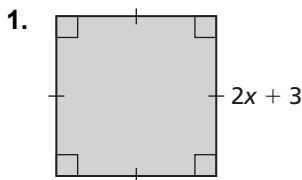Perimeter of a Rectangle: $P = 2\ell + 2w$ Area of a Rectangle: $A = \ell \cdot w$

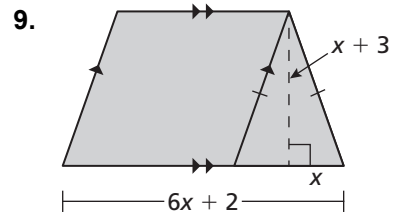Area of a Square: $A = s^2$ Area of a Triangle: $A = \dfrac{1}{2}bh$

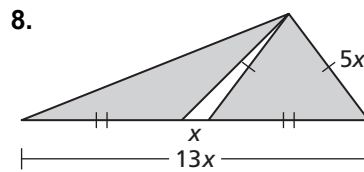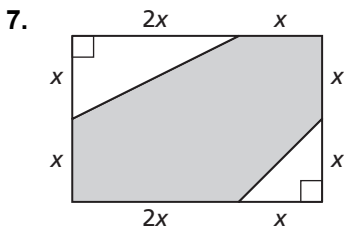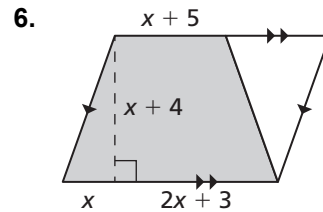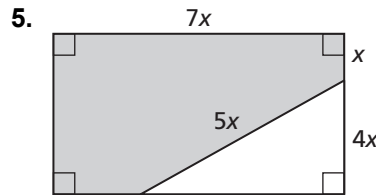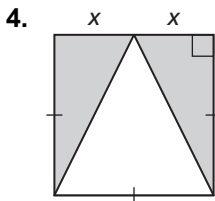Area of a Parallelogram: $A = b \cdot h$ Pythagorean Theorem: $a^2 + b^2 = c^2$

In Exercises 1–3, write an algebraic expression for the area and perimeter of each figure.

1.

$2x + 3$

2.

$x + 1$

x

$x + 4$

3.

$2x - 1$

$x + 3$

In Exercises 4–9, write an algebraic expression for the shaded area of the figure. (Recall that the height of an isosceles triangle bisects the base.)

4.

x x

5.

$7x$

x

$5x$

$4x$

6.

$x + 5$

$x + 4$

x $2x + 3$

7.

$2x$ x

x x

x x

$2x$ x

8.

$5x$

x

$13x$

9.

$x + 3$

x

$6x + 2$

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7.2 Puzzle Time

How Did The Doe Win The Race?

Write the letter of each answer in the box containing the exercise number.

Find the product.

1. $(x + 7)(x + 5)$

2. $(x + 9)(x - 4)$

3. $(x - 6)(x - 3)$

4. $(x - 8)(x - 2)$

5. $(4x + 11)(x - 1)$

6. $(6x + 7)(x + 3)$

7. $(2x - 9)(-5 + 4x)$

8. $(x - 10)(x + 1)$

9. $\left(x - \dfrac{7}{4}\right)\left(x - \dfrac{1}{4}\right)$

10. $(2 - 3x)(11x + 8)$

11. $(x - 6)(x^2 + 9x)$

12. $(x + 5)(x^2 + 4x + 4)$

13. $(x - 7)(x^2 + 2x + 1)$

14. $(x - 8)(x^2 - 7x + 12)$

15. $(6x^2 - 3x + 5)(4x^2 + 3)$

16. The length of a classroom is $(10x + 6)$ feet. The width of the classroom is $(9x + 8)$ feet. Find the area of the classroom.

Answers

H. $x^2 - 9x - 10$

U. $x^2 - 10x + 16$

B. $x^3 + 9x^2 + 24x + 20$

I. $6x^2 + 25x + 21$

S. $x^3 + 3x^2 - 54x$

E. $x^2 + 12x + 35$

P. $24x^4 - 12x^3 + 38x^2 - 9x + 15$

K. $x^3 - 5x^2 - 13x - 7$

T. $4x^2 + 7x - 11$

B. $x^2 + 5x - 36$

A. $x^2 - 2x + \dfrac{7}{16}$

N. $x^3 - 15x^2 + 68x - 96$

Y. $-33x^2 - 2x + 16$

S. $x^2 - 9x + 18$

G. $8x^2 - 46x + 45$

C. $90x^2 + 134x + 48$

2	10		15	9	11	3	6	14	7		5	8	1		12	4	16	13