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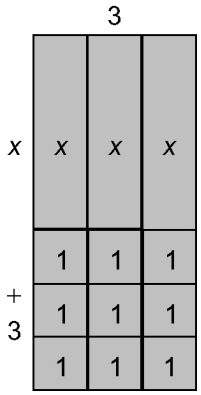
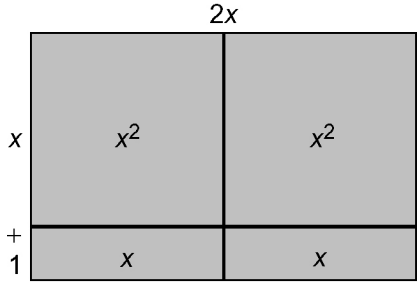
Section 5.1 Expand Binomials

1. Write expressions for the dimensions of each rectangle.

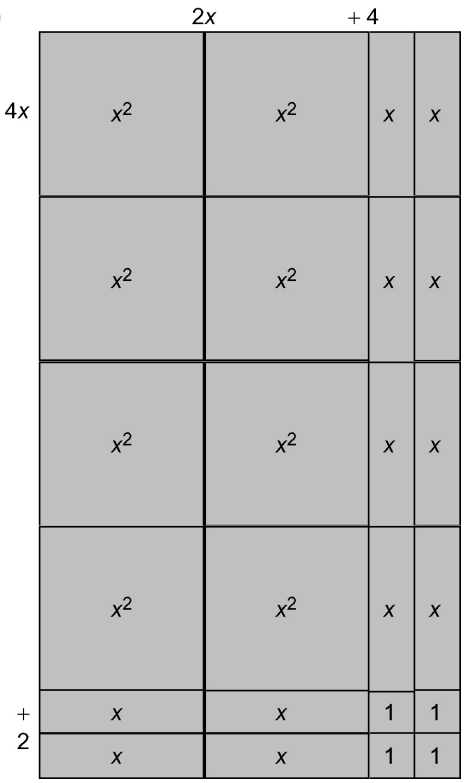
a)



b)



c)



2. For each rectangle in question 1, write a simplified expression for the area.

3. Expand and simplify.

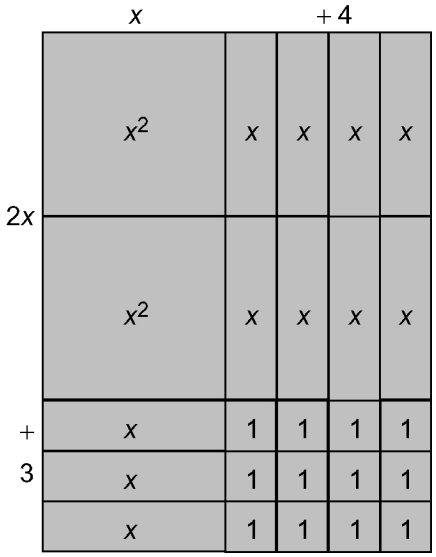
a) $3x(x - 6)$ **b)** $(x - 6)(x + 2)$
c) $(x - 7)(x + 7)$ **d)** $(x - 11)(x + 1)$
e) $(x + 7)(x + 7)$ **f)** $(x - 9)(x - 9)$

4. Expand and simplify.

a) $(3x - 7)(2x + 1)$ **b)** $(8x + 1)(2x - 5)$
c) $(3x + 1)(5x - 3)$ **d)** $(2 - 4x)(3 + x)$
e) $(3x + 1)2$ **f)** $(2x - 5)^2$
g) $(5x + 3)2$ **h)** $(9x - 1)^2$
i) $(10x + 3)2$ **j)** $(11 + 5x)^2$

5. Write a simplified expression for the area of each rectangle.

a)



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b)

	$2x$					$+5$
x	x^2	x^2	x	x	x	x	x
	x	x	1	1	1	1	1
	x	x	1	1	1	1	1
$+6$	x	x	1	1	1	1	1
	x	x	1	1	1	1	1
	x	x	1	1	1	1	1
	x	x	1	1	1	1	1

c)

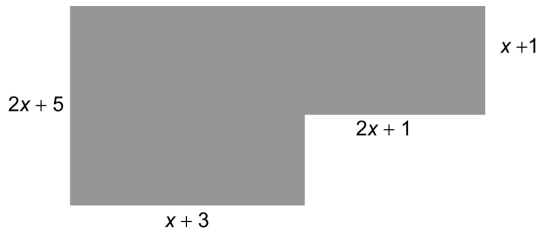
	$3x$			$+1$
x	x^2	x^2	x^2	x
	x	x	x	1
	x	x	x	1
	x	x	x	1
$+6$	x	x	x	1
	x	x	x	1
	x	x	x	1

6. Refer to question 5. Find the area of each rectangle if $x = 4$ cm.

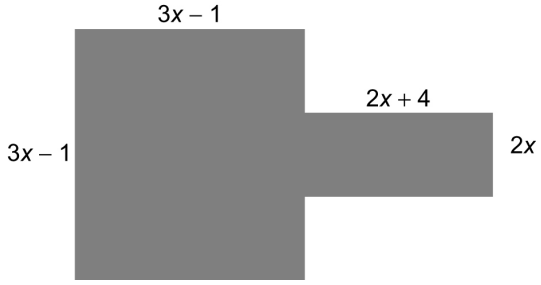
7. Angela's vegetable garden has dimensions $(3x + 4)$ by $(x + 6)$.
- **a)** Write an expression, in simplified form, for the area of her garden.
- **b)** If $x = 10$ m, find the actual area of Angela's garden.

8. Write an expression, in simplified form, for the shaded region of each figure.

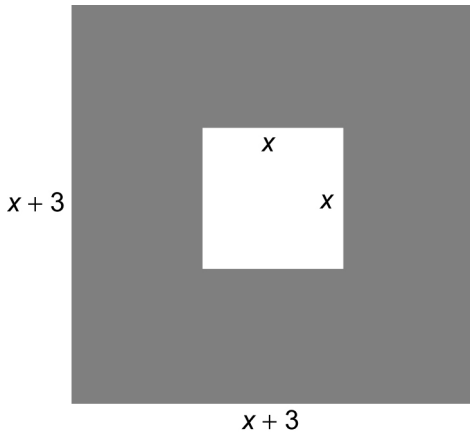
a)



b)



c)



9. Refer to question 8. Find the area of shaded region of each figure if $x = 5$ cm.

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10. The path of a firework rocket can be modelled by the relation $h = -2(d - 4)(d - 10)$, where d is the horizontal distance and h is the height, both in metres.

a) Expand and simplify the expression.

b) Use both the original and the simplified expressions to find the height when $d = 6$ m.

11. Each of the changes described is applied to a square with side length x. Find a simplified expression for the area of each resulting rectangle.

a) The length is increased by 7.

b) The length and width are tripled.

c) The length is increased by 6 and the width is decreased by 4.

d) The length is doubled and the width is increased by 2.

12. To expand and simplify the expression $(x + 5)(x + 2)$, Michael adds 5 and 2 to get 7, and multiplies 5 and 2 to get 10. His answer is $x^2 + 7x + 10$.

a) Explain the process Michael used.

b) Could Michael use the same process to expand $(2x + 5)(x + 2)$? Explain.