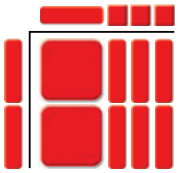
Practice

1. Write the product modelled by each set of tiles.
Determine the product.

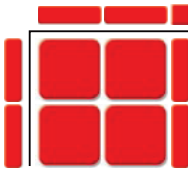
a)

b)



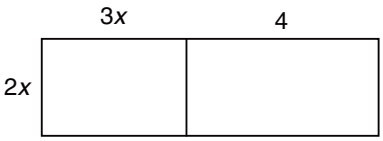
c)

d)

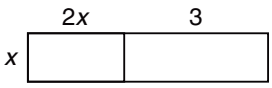


2. Write the product modelled by the area of each rectangle.
Determine the product.

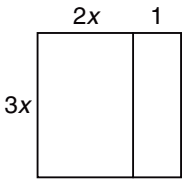
a)



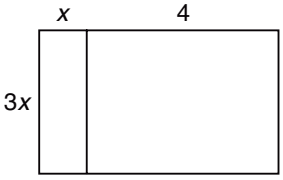
b)



c)



d)



3. Use algebra tiles to expand.

a) $x(3x + 2)$

b) $x(4x + 6)$

c) $3x(2x + 1)$

d) $4x(3x + 4)$

4. Use an area model to expand.

a) $4x(x + 3)$

b) $x(2x + 3)$

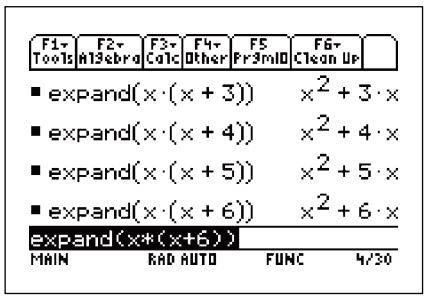
c) $2x(x + 6)$

d) $3x(5x + 2)$

5. Use the calculator screen at the right.

a) What patterns do you see?
Explain the patterns.

b) Write the next 2 lines in the patterns.



6. **Assessment Focus** Alex thinks that $x(x + 1)$ simplifies to $x^2 + 1$.
Choose a tool.
Use the tool to explain how to get the correct answer.

When we cannot use area models, we use paper and pencil.

Example

Expand: $-2x(4x^2 + 2x - 3)$

Solution Multiply each term of the polynomial by the monomial.

$$-2x(4x^2 + 2x - 3)$$
$$= (-2x)(4x^2) + (-2x)(2x) + (-2x)(-3)$$
$$= -8x^3 + (-4x^2) + (+6x)$$
$$= -8x^3 - 4x^2 + 6x$$

7. Expand.

a) $2x(6x - 2)$ **b)** $x(8x - 2)$ **c)** $5x(x - 7)$ **d)** $x(-4x + 3)$
e) $2x(3x^2 - 4)$ **f)** $4x(-2x - 3)$ **g)** $3x(2x - 4)$ **h)** $x(-x - 1)$

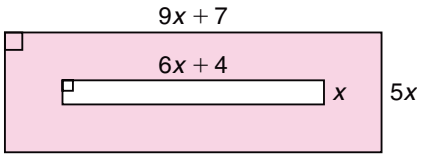
8. Expand.

a) $-2x(x + 3)$ **b)** $-x(2x + 1)$ **c)** $-x(-2x - 7)$ **d)** $-3x(2 - x)$
e) $-7x(4x - 9)$ **f)** $-x(2x + 3)$ **g)** $-2x(3x - 5)$ **h)** $-6x(2x + 3)$

9. Expand. Which method did you use each time?

a) $2x(x^2 - 2x)$ **b)** $-3x(3x^2 - 5x)$
c) $4x(8x^2 + 6)$ **d)** $7x(2x^2 + 3x - 1)$
e) $2x(-4x^2 + 5x - 7)$ **f)** $3x(4x^2 - 3x - 9)$
g) $-2x(x - 3x^2 + 1)$ **h)** $x(x^2 - 9 + x)$

10. **Take It Further**
This figure shows one rectangle inside another.
Determine an expression for the shaded area.
Simplify the expression.



In Your Own Words

How is multiplying a polynomial by a monomial like multiplying a polynomial by a constant?
How is it different?
Use examples to explain.