Sections 5.5 Multiplying and Dividing a Polynomial by a Constant

Remember the signs:

When multiplying or dividing.....

+ x + = +	- x + = -
- x - = +	+ x - = -

+ ÷ + = +	- ÷ + = -
- ÷ - = +	+ ÷ - = -

You will be expected to multiply and divide polynomials:

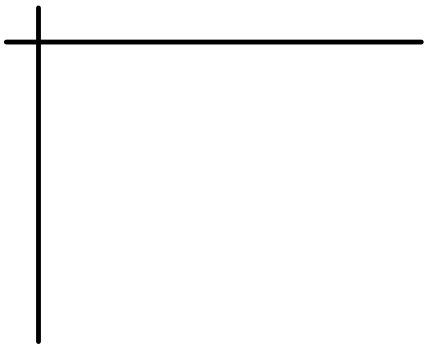
- using algebra tiles
- using area model
- symbolically

Example 1 Multiplying a polynomial by a constant.

(a) $3(2x)$

Use Algebra Tiles:

Use Algebra:

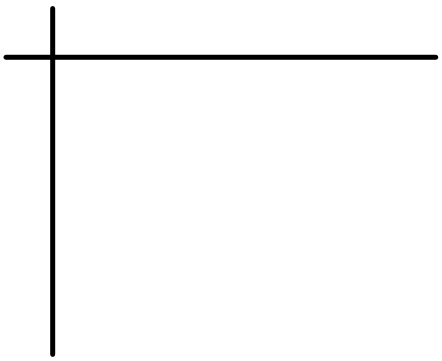


Use an Area Model:

Think: A = L x W
Area of a rectangle

(b) $3(2x+2)$

Use Algebra Tiles:



Use an Area Model:

Use Algebra:

Multiply each term of the polynomial inside the bracket by the monomial in front of the bracket.

Example 2 Multiply using algebra tiles.

(a) $2(2x+3)$

(b) $4(2x+1)$

Example 3 How would you sketch negatives with algebra tiles?

(a) $3(-2m+4)$ (b) $-4(x+2)$

Your Turn Multiply using algebra tiles. Check your answer using algebra

(c) $-(2x-1)$

Example 4 Multiply using distributive property .... using algebra.
Be careful with signs!

(a) $3(-2m+4)$ (b) $-8(x-5)$

(c) $-2(-n^2+2n-1)$ (d) $-4(x+2)$

Your Turn Multiply using the distributive property.

(e) $3(x-7)$

(f) $-10(x+2)$

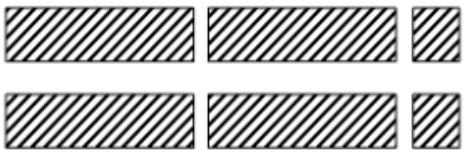
(g) $3(-8-7x)$

(h) $2(x+10)$

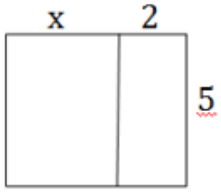
Example 5 Sketch the answer using the area model.

$$-2(-n^2+2n-1)$$

Example 6 Determine the length, width and area of the following. Write a multiplication sentence.

a) 

b)



Example 7 Determine the area of the following. Write a multiplication sentence.

a) Length = $2x+2$
Width = 4

b) Length = $-x+3$
Width = 2

When dividing by a constant term → think about arranging the tiles into equal groups.

Example 8 Divide a polynomial by a constant. Use algebra tiles.

(a) $\frac{4x^2}{2}$

(b) $\frac{4x^2 - 8x}{2}$

Example 9 Divide symbolically.

a). $\frac{4x^2}{2}$

Divide the numbers.
Reduce to lowest terms if possible.

b). $\frac{4x^2 - 8x}{2}$

Rewrite as two fractions.
Divide both monomials.

NOTE:
However many terms are in the numerator, that's how many terms are in your answer. When dividing a trinomial by a monomial, you will have a trinomial answer.

Example 10 Divide

Be careful when dividing by negatives!

(a) $\dfrac{12m^2+6m-9}{3}$

(b) $\dfrac{-3y^2+15xy-21x^2}{-3}$

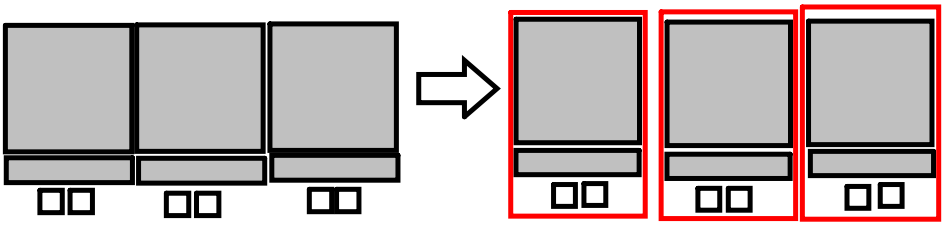
Your Turn

(c) $\dfrac{24m^2}{8}$

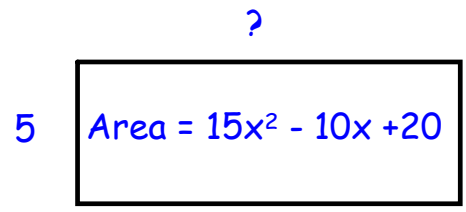
(d) $\dfrac{-6p^2+9p-3}{-3}$

Example 11 Write a division sentence to represent each diagram below?

(a)



(b)



Example 12

(a) The perimeter of a square is $16x^2 - 12y$. What is the length of each side of the square?

(b) If the area of a rectangle is $21y^2 + 14y - 7$ and the width is 7cm, what is the length of the rectangle?

Work Book Questions	Extra Practice Questions
p.246 - 248 #3cd, 8a(i)(ii)(iii)(iv), 9ab, 11ab, 12, 13bdf, 14, 15abcdef, 16aceg, 17abc,18a(i)(ii)(iii)(iv)(v)(vi), 20ab,21ab, 22ace, 23ac	p.246-248 #5, 6, 7, 10, 11cdef, 13ace, 16bdfh, 17def, 22bd, 23bd