

**Algebra**  
**Unit 1 Line Master 8e**

# ***Multiplying and Dividing Polynomials*** **Answers**

## **Part A: Multiplying Polynomials**

1.  $2x$  represents the product of  $2 \times (x)$ .

Model  $(x) \times (x)$ .

Model  $2 \times (x)$ .

	x
x	$x^2$

	x
1	x
1	x

The two models are not equivalent.

So,  $(x) \times (x) \neq 2x$ .

2. a)  $2x(3x + 1) = 6x^2 + 2x$

	x	x	x	1
x	$x^2$	$x^2$	$x^2$	x
x	$x^2$	$x^2$	$x^2$	x

b)  $-3x(4x - 1) = -12x^2 + 3x$

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

**Multiplying and Dividing Polynomials**  
**Answers (cont'd)**

3. a)  $2(2x^2 - 3x + 1) = 4x^2 - 6x + 2$

b)  $4(5y^2 - 3y + 8) = 20y^2 - 12y + 32$

c)  $-6x(-2x - 9) = 12x^2 + 54x$

**Part B: Dividing Polynomials**

1. I know that when I divide a polynomial by a monomial, I can write each term of the polynomial as a division with the monomial as the denominator. For example,

$$(-6x^2 + 12x) \div 3x \text{ can be written as } \frac{-6x^2}{3x} + \frac{12x}{3x}.$$

I can then simplify the individual fractions.

I also know that when dividing like terms with different exponents, I subtract the exponents. So,  $x^2 \div x = x$ , because  $2 - 1 = 1$ .

2. a)  $(8x^2 + 2x) \div (2x) = \frac{8x^2}{2x} + \frac{2x}{2x}$

$$= 4x + 1$$

b)  $(-6x^2 - 3x) \div (-3x) = \frac{-6x^2}{-3x} + \frac{-3x}{-3x}$

$$= 2x + 1$$

c)  $(-6x^2 - 8x) \div (2x) = \frac{-6x^2}{2x} + \frac{-8x}{2x}$

$$= -3x - 4$$

***Multiplying and Dividing Polynomials***  
**Answers (cont'd)**

$$3. a) \left(\frac{9s}{-3}\right)(-4s) = (-3s)(-4s) \\ = 12s^2$$

b) The order of operations tells me that I need to simplify the expression inside the first set of brackets before multiplying by the expression in the second set of brackets. If I didn't do this, I would have to multiply and divide larger numbers:

$\frac{-36s^2}{-3}$ . The answer would be the same because the order in which multiplication and division are performed doesn't matter.

$$4. a) (14x^2 - 7x) \div 7x = \frac{14x^2}{7x} - \frac{7x}{7x} \\ = 2x - 1$$

$$b) (-8x^2 + 6x - 4) \div 2 = \frac{-8x^2}{2} + \frac{6x}{2} - \frac{4}{2} \\ = -4x^2 + 3x - 2$$

$$c) \left(\frac{4m^2}{-2m}\right)(-3m) = (-2m)(-3m) \\ = 6m^2$$