7.2 Multiplying Polynomials by Monomials

November 25, 2015 11:19 AM

✡ Review: mult: $(2x)(-5x) = (2)(-5)(x)(x) = -10x^2$

(#s × #s; variables × variables (add exp))

div: $\frac{6x^2}{2x} = \left(\frac{6}{2}\right)\left(\frac{x^2}{x^1}\right) = 3x$

(divide #s by #s and variables by variables (subtract exp))

✡ When multiplying a polynomial by a monomial, you must multiply each term of the polynomial by the monomial.

→ this is called the distributive property

$2(6) = 12$ ✓

$2(2 \cdot 3)$

$4 \cdot 6 = 24$ ✗

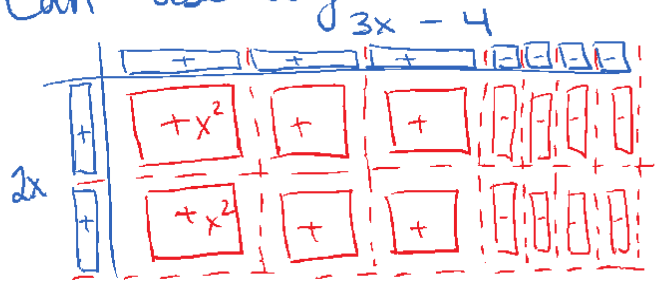
$2x(3x-4)$

monomial binomial

$= 2x(3x) - 2x(4)$ ← expanded expression

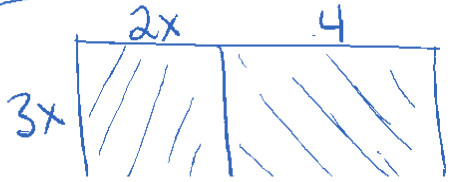
$= 6x^2 - 8x$ ← simplified expression

Can use algebra tiles too: $2x(3x-4)$



$6x^2 - 8x$ ← same answer

Area model:



→ $A = (3x)(2x+4)$

$\rightarrow A = (3x)(2x+4)$

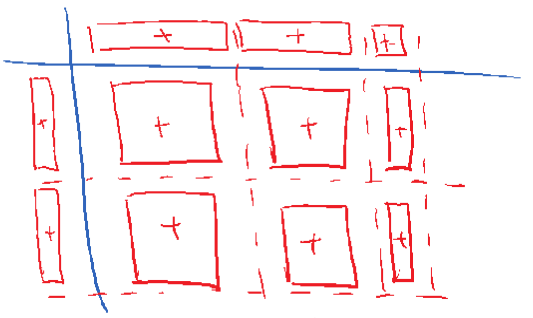
$= 3x(2x) + (3x)(4)$

$= 6x^2 + 12x$

✡ Examples

a) Calculate $2x(2x+1)$

i) using algebra tiles



$4x^2 + 2x$

ii) algebraically

$2x(2x+1)$

$= 2x(2x) + 2x(1)$ ← expanded expression

$= 4x^2 + 2x$ ← simplified expression

b) Expand using the distributive property:

i) $(2+3x)(3x) = (3x)(3x) + (3x)(2)$

$= 9x^2 + 6x$

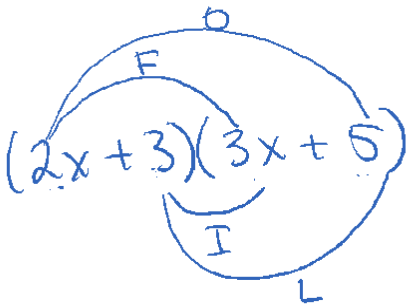
ii) $(-3x)(2x+5) = -6x^2 + -15x$

$\rightarrow (-3x)(2x) + (-3x)(5)$

iii) $5x(2x-1) = 5x(2x) - 5x(1)$

$= 10x^2 - 5x$

Aside



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

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

$= 6x^2 + 10x + 9x + 15$

$= 6x^2 + 19x + 15$)

$2x(3x+5)$

$+ 3(3x+5)$

Practice pg 269 # 4-14