9.2: Multiplying Polynomials

Goals: * Multiply a monomial and a polynomial using distributive property
* Multiply Binomials by using the FOIL method
* Multiply polynomials

Multiply a monomial and a polynomial: Use the distributive property

Ex: $x(7x^2 + 4)$

$7x^3 + 4x$

Ex: $(2x^3)(x^3 + 3x^2 - x + 5)$

$2x^6 + 6x^5 - 2x^4 + 10x^3$

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

$6x^5 - 3x^4 + 12x^3 + 9x^2$

Multiply binomials: FOIL

Ex: $(x - 3)(3x + 2)$

$3x^2 - 10x - 8$

Ex: $(a + 3)(2a + 1)$

$2a^2 + 7a + 3$

Ex: $(4n - 1)(n + 5)$

$4n^2 + 19n - 5$

Ex: $(x + 4)(2x - 1)$

$2x^2 + 7x - 4$

Multiplying Polynomials: Repeated distribution

Ex: $(b^2+6b-7)(3b-4)$

$3b^3-4b^2+18b^2-24b-21b+28$
$3b^3+14b^2-45b+28$

Ex: $(2x^2+5x-1)(4x-3)$

$8x^3+14x^2-19x+3$

Ex: $(x^2+2x+1)(x+2)$

x^3+4x^2+5x+2

Ex: $(3y^2-y+5)(2y-3)$

$6y^3-11y^2+13y-15$

Ex: $(a^2+3a-4)(2a+3)$

$2a^3+9a^2+a-12$

Ex: $(2x^2-x-2)(3x-1)$

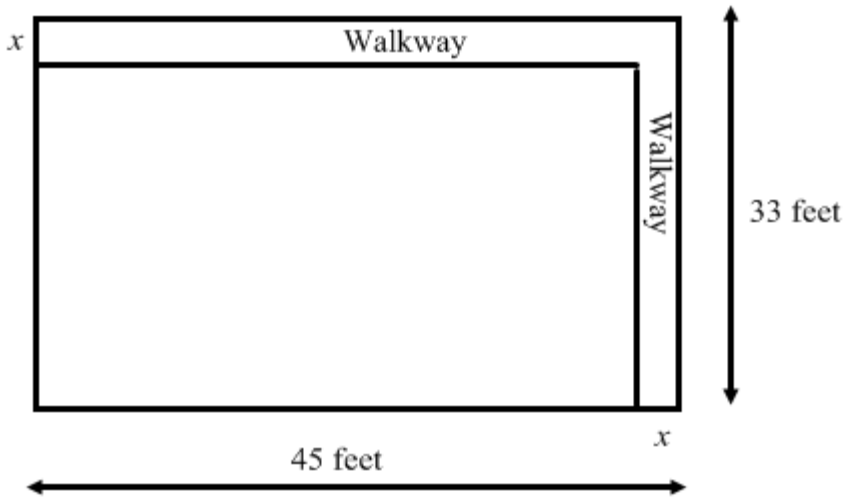
$6x^3-5x^2-5x+2$

Ex: The dimensions of a rectangle are $x + 3$ and $x + 2$. Write a simplified expression to represent the area of the rectangle.

$A = l \cdot w$
$(x + 3)(x + 2)$
$x^2 + 5x + 6$

Ex: You are designing a rectangular skateboard park on a lot that is on the corner of a city block. The park will have a walkway along two sides that is x feet wide.

· Write a polynomial that represents the area of the skate park.



Length = $45 - x$ Width = $33 - x$ Area = $l \cdot w$ $(45 - x)(33 - x)$

$1485 - 78x + x^2$

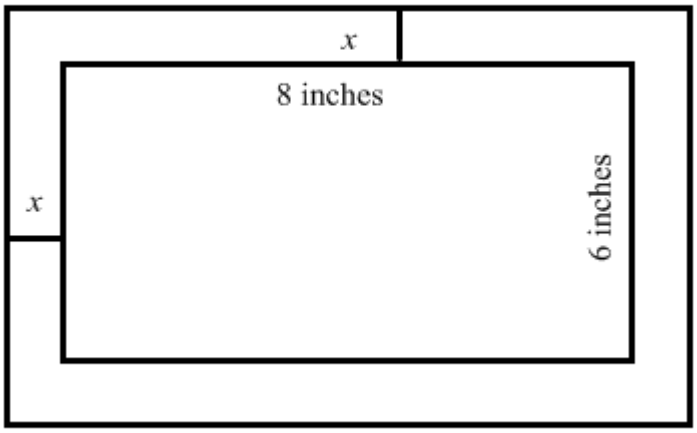
· What is the area if walkway is 3 feet wide? Plug 3 into simplified expression.

$1485 - 78(3) + (3)^2$

1260 ft²

Ex: A rectangular trivet has a ceramic center and wooden border.

· Write a polynomial that represents the total area.



Length = $8 + 2x$ Width = $6 + 2x$ $(8 + 2x)(6 + 2x)$

$48 + 28x + 4x^2$

· What is the area if the width of the border is 2 inches?

120 in²