

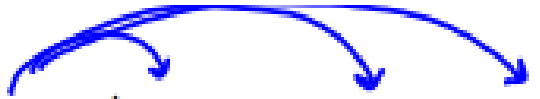
6.5 Multiply Polynomials

- In order to multiply polynomials, we actually just **distribute.**
- When you are multiplying with the **same base:** **multiply the numbers, keep the base, ADD the exponents.**


Ex1) $3x^1(4x^2 - 5x^1)$

$$= 12x^3 - 15x^2$$

Note: Always put your Answer in Standard Form. Starting with the highest exponent and goes down in a decreasing order.

$$\text{Ex2) } -5xy(6x^2 - 4y + 3)$$


$$= -30x^3y + 20xy^2 - 15xy$$

$$\text{Try) } -2x^2y(8x^2y - 6xy^2 + 5x)$$


$$= -16x^4y^2 + 12x^3y^3 - 10x^3y$$

Multiplying Binomial and Binomial: FOIL

F: **F**irst

O: **O**uter

I: **I**nner

L: **L**ast

Ex3)

$$(2x - 3)(4x + 7)$$

outer inner

1st Last 1st Last

$$= 8x^2 + 14x - 12x - 21$$

combine like term

$$= 8x^2 + 2x - 21$$

$$\text{Ex4)} \quad (-5x - 6)(3x - 2)$$

$$= -15x^2 + 10x - 18x + 12 = \boxed{-15x^2 - 8x + 12}$$

combine like term

$$\text{Try)} \quad (7x - 8)(-4x + 3)$$

$$= -28x^2 + 21x + 32x - 24$$

$$= \boxed{-28x^2 + 53x - 24}$$

Special Products:

DO NOT

Distribute
the power!!

Just write the
() twice

Ex5) $(5x+2)^2$

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

$= 25x^2 + 10x + 10x + 4$

FOIL

$= 25x^2 + 20x + 4$

↑ 1st square
↑ double the middle
↑ square last



Ex6) $(-4x+3)^2$

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

$= 16x^2 - 12x - 12x + 9$



$= 16x^2 - 24x + 9$

↑ 1st square
↑ square last

$$\text{Try1) } (-2x+3)^2$$

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


$$= 4x^2 - 6x - 6x + 9$$

$$= \boxed{4x^2 - 12x + 9}$$

$$\text{Try2) } (x-4)^2$$

$$= (x-4)(x-4)$$


$$= x^2 - 4x - 4x + 16$$

$$= \boxed{x^2 - 8x + 16}$$

$$\text{Ex7) } (x+3)(x-3)$$

$$= x^2 - \cancel{3x} + \cancel{3x} - 9$$

$$= \boxed{x^2 - 9}$$

difference of

2 square

$$\text{Ex8) } (2x-4)(2x+4)$$

$$= 4x^2 + \cancel{8x} - \cancel{8x} - 16$$

$$= \boxed{4x^2 - 16}$$

$$\text{Try1) } (3x+4)(3x-4)$$

$$= 9x^2 - \cancel{12x} + \cancel{12x} - 16$$

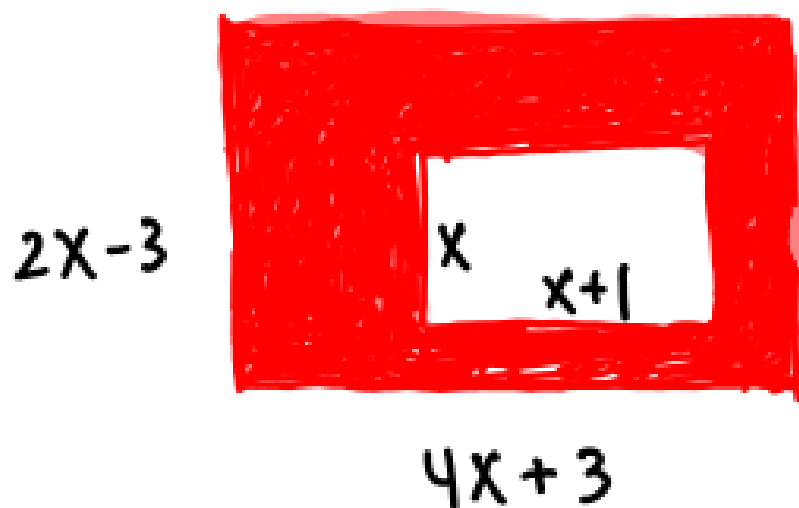
$$= \boxed{9x^2 - 16}$$

$$\text{Try2) } (4x-5)(4x+5)$$

$$= 16x^2 + \cancel{20x} - \cancel{20x} - 25$$

$$= \boxed{16x^2 - 25}$$

Ex9) Write an expression to represent the area of the shaded part. length x width



Area of the Big \square - Area of the Small \square

$$(2x-3)(4x+3) - x(x+1)$$

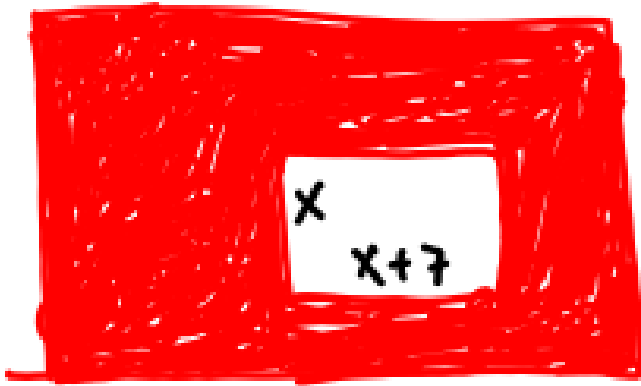
$$= \underline{8x^2} + \underline{6x} - \underline{12x} - 9 - \underline{x^2} - \underline{x}$$

combine like term

$$= \boxed{7x^2 - 7x - 9}$$

#25)

$5x+2$



$3x-1$