

Multiplying Complex Polynomials

September-11-18
9:12 AM

PRE-CALCULUS 11 MATHEMATICS 10 REVIEW MULTIPLYING COMPLEX POLYNOMIALS

1) Simplify the following.

$$\begin{aligned} \text{a) } & 4(x-5y)(2x+3y) \\ & (4x-20y)(2x+3y) \\ & 8x^2 + 12xy - 40xy - 60y^2 \\ & = \boxed{8x^2 - 28xy - 60y^2} \end{aligned}$$

$$\begin{aligned} \text{b) } & 3(2x+5y)^2 \\ & 3(2x+5y)(2x+5y) \\ & (6x+15y)(2x+5y) \\ & 12x^2 + 30xy + 30xy + 75y^2 \\ & = \boxed{12x^2 + 60xy + 75y^2} \end{aligned}$$

$$\begin{aligned} \text{c) } & (x-2)(x^2-3x+4) \\ & x^3 - 3x^2 + 4x - 2x^2 + 6x - 8 \\ & = \boxed{x^3 - 5x^2 + 10x - 8} \end{aligned}$$

$$\begin{aligned} \text{d) } & (x-1)(x+2)(x+5) \\ & x^2 + 2x - x - 2 \\ & (x^2 + x - 2)(x+5) \\ & x^3 + 5x^2 + x^2 + 5x - 2x - 10 \\ & = \boxed{x^3 + 6x^2 + 3x - 10} \end{aligned}$$

$$e) (x+3y)^3$$

$$(x+3y)(x+3y)(x+3y)$$

$$x^2 + 3xy + 3xy + 9y^2$$

$$(x^2 + 6xy + 9y^2)(x+3y)$$

$$x^3 + 3x^2y + 6x^2y + 18xy^2 + 9xy^2 + 27y^3$$

$$= x^3 + 9x^2y + 27xy^2 + 27y^3$$

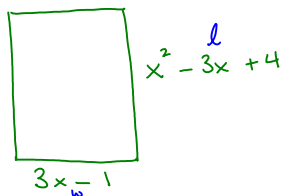
$$f) 2(x+3)(x^2-5x-1)$$

$$(2x+6)(x^2-5x-1)$$

$$2x^3 - 10x^2 - 2x + 6x^2 - 30x - 6$$

$$= 2x^3 - 4x^2 - 32x - 6$$

- 2) A rectangle has a length of $x^2 - 3x + 4$ and a width of $3x - 1$. Write an expression to represent the area of the rectangle.



$$A = lw$$

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

$$A = 3x^3 - x^3 - 9x^2 + 3x + 12x - 4$$

$$A = 3x^3 - 10x^2 + 15x - 4$$

- b) If $x = 3 \text{ cm}$, determine the area of the rectangle.

$$A = 3x^3 - 10x^2 + 15x - 4$$

$$A = 3(3)^3 - 10(3)^2 + 15(3) - 4$$

$$A = 32 \text{ cm}^2$$

Assignment: Multiplying Polynomials Part 2 Assignment #1 - 5

Assignment

1. Expand and simplify

a) $(y - 5)(y^2 + 2y + 4)$

b) $(3m + 7)(m^2 - 3m + 6)$

c) $(x^2 - 7)(2x^3 + 4x - 1)$

d) $(-m^2 - m + 1)(m + 1)$

e) $(a - 3b)(4a^2 - 3ab - 2b^2)$

f) $2(5x + 2)(3x^2 + x - 4)$

2. Expand and simplify.

a) $(x + 1)(x + 2)(3x + 5)$

b) $(h - 4)(2h - 3)(3h - 1)$

c) $(a + 3b)(2a - 5b)(2a + 5b)$

d) $(3x + 7y)(4x - 3y)(x - 4y)$

e) $(x - 3)(2x + 1)^2$

f) $(2z + 3)^3$

20 Polynomial Operations Lesson #3: *Multiplication of Polynomials - Part Two*

- 3.** A rectangle has length $(x^2 + 4x - 1)$ cm and width $(3x - 2)$ cm.
- Write and simplify an expression for the area of the rectangle in cm^2 .

 - If $x = 2.5$, calculate the area of the rectangle.
- 4.** Dice for a children's board game are cubes with an edge length of $(3x - 2)$ mm.
- Write and simplify an expression for the volume of a die in mm^3 .

 - The manufacturer packages dice in cubic containers containing 64 dice. Determine the volume of the container in cm^3 if $x = 4$.
- 5.** A rectangular prism has length $(5x - 2)$ cm, width $(3x - 1)$ cm and height $(3x + 1)$ cm.
- Write and simplify an expression for the volume of the rectangular prism in cm^3 .

 - Write and simplify an expression for the surface area of the rectangular prism in cm^2 .

 - If $x = 4$, calculate the volume and surface area of the rectangular prism.

Answer Key

1. a) $y^3 - 3y^2 - 6y - 20$ b) $3m^3 - 2m^2 - 3m + 42$ c) $2x^5 - 10x^3 - x^2 - 28x + 7$
d) $-m^3 - 2m^2 + 1$ e) $4a^3 - 15a^2b + 7ab^2 + 6b^3$ f) $30x^3 + 22x^2 - 36x - 16$
2. a) $3x^3 + 14x^2 + 21x + 10$ b) $6h^3 - 35h^2 + 47h - 12$ c) $4a^3 + 12a^2b - 25ab^2 - 75b^3$
d) $12x^3 - 29x^2y - 97xy^2 + 84y^3$ e) $4x^3 - 8x^2 - 11x - 3$ f) $8z^3 + 36z^2 + 54z + 27$
3. a) $(x^2 + 4x - 1)(3x - 2) = 3x^3 + 10x^2 - 11x + 2 \text{ cm}^2$ b) 83.875 cm^2
4. a) $(3x - 2)^3 = 27x^3 - 54x^2 + 36x - 8 \text{ mm}^3$ b) 64 cm^3
5. a) $(5x - 2)(3x - 1)(3x + 1) = 45x^3 - 18x^2 - 5x + 2 \text{ cm}^3$
b) $2(3x - 1)(3x + 1) + 2(3x - 1)(5x - 2) + 2(3x + 1)(5x - 2) = 78x^2 - 24x - 2 \text{ cm}^2$
c) volume = 2574 cm^3 , surface area = 1150 cm^2