

Name _____

Multiplying Polynomials

Use each word in the box to complete the statement

term	distribute	combine	polynomial	first
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To multiply polynomials you need to _____ each _____ of the _____ polynomial to each term of the second _____, then _____ like terms if possible.

$$\begin{aligned}\text{Ex 1: } 3x(2x+3) &= (3x)(2x) + (3x)(3) \\ &= 6x^2 + 9x\end{aligned}$$

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

$$\begin{aligned}\text{Ex 3: } (x+3)(2x^2+3x+1) &= x(2x^2) + x(3x) + x(1) + 3(2x^2) + 3(3x) + 3(1) \\ &= 2x^3 + 3x^2 + x + 6x^2 + 9x + 3 \\ &= 2x^3 + 9x^2 + 10x + 3\end{aligned}$$

Multiply: Express all answers in Standard Form

1. $2x(2x+7)$

9. $(6x-1)(3x-1)$

2. $3x(x+5)$

10. $(5x-2)(2-3x)$

3. $9x^2(3x-8)$

11. $(x+1)(2x^2+3x+4)$

4. $-5x(3x^2+2x-7)$

12. $(2x-3)(x^2-2x+1)$

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

13. $(2x^2-3x+1)(x+2)$

6. $(x+2)(2x-3)$

14. $(3x^2+2x)(x-3)$

7. $(3x-1)(2x+5)$

8. $(x-7)(x+10)$

15. $(x^2+5)(20x-17)$

Dividing Polynomials

Use each word in the box to complete the statement

dividing	numerator	monomial	coefficients	common
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To divide a polynomial by a monomial, you distribute the _____ in the denominator to each term in the _____. Simplify each term by _____ the _____ and canceling out the _____ variable factors.

$$\text{Ex 1: } \frac{18x^5}{6x^2} = \left(\frac{18}{6}\right) \cdot \left(\frac{x^5}{x^2}\right) = 3x^3$$

$$\text{Ex 2: } \frac{5x^4 - 15x^2 + 25x}{5x} = \frac{5x^4}{5x} - \frac{15x^2}{5x} + \frac{25x}{5x} = x^3 - 3x + 5$$

Divide: Express all answers in Standard Form

$$1. \frac{12x^3}{4x^2}$$

$$4. \frac{10x^2y + 5xy^2}{xy}$$

$$2. \frac{25a^3 - 10a^2}{5a}$$

$$5. \frac{24m^4 - 16m^2}{8m^3}$$

$$3. \frac{x^2 + 4x + 8}{2}$$

$$6. \frac{36y^3 - 18y^2 + 9y + 12}{3y}$$

To divide a polynomial by a polynomial use long division. (optional)

$$7. (x^2 + 10x + 16) \div (x + 2) = x + 2 \overline{)x^2 + 10x + 16}$$

$$8. (6x^3 + 19x^2 + 12x + 2) \div (2x + 5) = 2x + 5 \overline{)6x^3 + 19x^2 + 12x + 2}$$