

3.2 Add, Subtract, and Multiply Polynomials

Simplify: watch what operation you are performing!

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| <p>1. $(2x^3 - 5x^2 + 3x - 9) + (x^3 + 6x^2 + 11)$</p> $2x^3 - 5x^2 + 3x - 9 + x^3 + 6x^2 + 11$ $\boxed{3x^3 + x^2 + 3x + 2}$ <p>OR:</p> $\begin{array}{r} 2x^3 - 5x^2 + 3x - 9 \\ + \quad x^3 + 6x^2 \quad \quad + 11 \\ \hline \boxed{3x^3 + x^2 + 3x + 2} \end{array}$ | <p>2. $(8x^3 - 5x + 1) - (3x^3 + 2x^2 - x + 7)$</p> $8x^3 - 5x + 1 - 3x^3 - 2x^2 + x - 7$ $\boxed{5x^3 - 2x^2 - 4x - 6}$ <p>OR:</p> $\begin{array}{r} 8x^3 - 5x + 1 \\ - 3x^3 - 2x^2 + x - 7 \\ \hline \boxed{5x^3 - 2x^2 - 4x - 6} \end{array}$ |
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Multiplying Polynomials: Distribute, combine like terms, and write in descending order.

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| <p>3. $(x-5)(x^2 - 2x + 3)$</p> $x^3 - 2x^2 + 3x - 5x^2 + 10x - 15$ $\boxed{x^3 - 7x^2 + 13x - 15}$ | $\begin{array}{r} x^2 - 2x + 3 \\ \underline{\quad x - 5} \\ -5x^2 + 10x - 15 \\ \hline x^3 - 2x^2 + 3x \\ \hline \boxed{x^3 - 7x^2 + 13x - 15} \end{array}$ |
| <p>4. $(x-5)(x+1)(x+3)$</p> $x^2 - 5x + 1x - 5$ $(x^2 - 4x - 5)(x+3)$ $x^3 - 4x^2 - 5x + 3x^2 - 12x - 15$ $\boxed{x^3 - x^2 - 17x - 15}$ | |
| <p>5. $(x-2)^3$</p> $(x-2)(x-2)(x-2)$ $(x^2 - 4x + 4)(x-2)$ $x^3 - 4x^2 + 4x - 2x^2 + 8x - 8$ $\boxed{x^3 - 6x^2 + 12x - 8}$ | |
| <p>6. $-x^3(2x+3)^2$</p> $-x^3(2x+3)(2x+3)$ $-x^3(4x^2 + 12x + 9)$ $\boxed{-4x^5 - 12x^4 - 9x^3}$ | |

Write your final

answer in standard form.

1. $(2y^2 - 5y + 1) + (y^2 - y - 4)$

$$2y^2 - 5y + 1 + y^2 - y - 4$$

$$3y^2 - 6y - 3$$

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

$$-6x^6 + 8x^5 - 2x^4$$

3. $(b^4 + 10b) - (4b^3 + 6b^2 - b + 5)$

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

$$b^4 - 4b^3 - 6b^2 + 11b - 5$$

4. $(2p+1)(6p^2+7)$

$$12p^3 + 14p + 6p^2 + 7$$

$$12p^3 + 6p^2 + 14p + 7$$

5. $(x+5)^3$

$$(x+5)(x+5)(x+5)$$

$$(x^2 + 10x + 25)(x+5)$$

$$x^3 + 10x^2 + 25x + 5x^2 + 50x + 125$$

$$x^3 + 15x^2 + 75x + 125$$

6. $(d^2 - 6d + 1) - (2d^2 + d - 8)$

$$d^2 - 6d + 1 - 2d^2 - d + 8$$

$$-d^2 - 7d + 9$$

7. $(n-1)(n^2 + 6n - 2)$

$$n^3 + 6n^2 - 2n - n^2 - 6n + 2$$

$$n^3 + 5n^2 - 8n + 2$$

8. $(3x+2)(x+1)(x-4)$

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

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

$$3x^3 - 9x^2 - 12x + 2x^2 - 6x - 8$$

$$3x^3 - 7x^2 - 18x - 8$$