

6.1 Practice:

Add or subtract. Write your answer in standard form.

- $(7x^3 + 2x - 1) + (8x^2 - 6 + 2x - x^3)$
- $(12 - 11x - 5x^5) - (4x^4 + 8x - 4x^5 + 2x^3 - 1)$

6.2 Practice

Find each product.

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

6.3 Practice

Use the Binomial Theorem to expand each binomial.

- $(x + y)^5$
- $(4x - y)^4$

6.4 Practice

Simplify each polynomial. Then factor it.

- $3x^4 + 4x^3 - 4x^2$
- $128x^3 - 250$
- $8x^3 + 125$
- $2x^3 + 4x^2 - 30x$

Factor each polynomial by grouping. Be sure to factor the polynomial completely.

- $b^3 - 2b^2 - b + 2$
- $24v^3 + 56v^2 - 15v - 35$

6.5 practice:

Divide by using long division.

- $(12x^4 + 23x^3 - 9x^2 + 15x + 4) \div (3x - 1)$
- $(x^3 + 12x^2 - 4) \div (x - 3)$

Divide by using synthetic division.

- $(9x^2 - 3x + 11) \div (x - 6)$
- $(3x^4 - 2x^2 + 1) \div (x + 2)$

Use synthetic substitution to evaluate $P(x)$ for the given value.

- $P(x) = 4x^3 - 12x - 2$ for $x = 5$
- $P(x) = -3x^4 + 5x^3 - x + 7$ for $x = -2$

Use the Factor Theorem to verify that the given binomial is a factor of $P(x)$. Then divide.

- $(x + 5); P(x) = 2x^2 + 6x - 20$
- $(x - 1); P(x) = x^4 - 6x^3 + 4x^2 + 1$