(14) $(4w^{-3}z^{-5})(8w)^2$

$(4w^{-3}z^{-5})(64w^2)$

$256w^{-1}z^{-5} = \frac{256}{wz^5}$

(17) $\frac{3a^4b}{2ab} \cdot \frac{4a^2b^3}{b^6} = \frac{12a^6b^4}{2ab^7}$

a^{6-1} b^{4-7}

$= 6a^5b^{-3}$

$= \frac{6a^5}{b^3}$

6.3 Operations with Polynomials

monomial - a number, a variable, or a product of numbers and variables Ex: 7, y, $8xz$

constant - a monomial with no variables

coefficient - the numerical factor in a monomial

degree of a monomial - the sum of the exponents of its variables

Ex| $3xy^2z^3$ degree: 6

polynomial - a monomial or a sum of terms that are monomials

binomial - a polynomial with two terms

trinomial - a polynomial with three terms

degree of a polynomial - the same as that of its term with the greatest degree

Ex| $3x^2y + 7x^3y^7 + 4xy - 10x$

degree: 3, degree: 10, degree: 2, degree: 1

degree: 10

CLASSIFICATION OF POLYNOMIALS BY DEGREE

DEGREE	NAME	EXAMPLE
0	Constant	$7, 6, -3$
1	linear	$3x+5$
2	quadratic	$3y^2+2y+7$
3	cubic	$2x^3$
4	quartic	$4z^4+8$
5	quintic	$10w^5+4z^4$

EXAMPLE: Rewrite each polynomial in descending order. high → low
Then classify each polynomial by its degree and number of terms.

1. $2x^2 - 8x - 4x^4$

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

quartic

trinomial

2. $-9x + 10x^3$

$10x^3 - 9x$

cubic

binomial

3. $-x^4 + 9x + 7x^5 - 6$

$7x^5 - x^4 + 9x - 6$

quintic

4-term polynomial

To add and subtract polynomials, combine like terms.
Write your answer in standard form, which is with the exponents in ***descending*** order of degree.

4. Find the sum.

$(-2x^2 - 3x^3 + 5x + 4) + (-2x^3 + 7x - 6)$

$-5x^3 - 2x^2 + 12x - 2$

5. Find the difference.

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

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

$-9x^3 - x^2 + 9x - 9$

6. $(2x^4 + 4x^3 + 5x - 2) + (-2x^4 - 7x^2 + 8x - 10)$

7. $(3x^3 - 12x^2 - 5x + 1) - (-x^2 + 5x + 8)$

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

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

$5x^3 + 3x^2 - 4x - 10x^2 - 6x + 8$

$5x^3 - 7x^2 - 10x + 8$

9. Multiply $(x - 1)(x + 2)(x - 3)$.

$x^2+2x-1x-2$

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

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

$\boxed{x^3-2x^2-5x+6}$

10. Multiply $(x + 4)^3$.

$(x+4)(x+4)(x+4)$

$x^2+4x+4x+16$

$(x+4)(x^2+8x+16)$

$x^3+8x^2+16x+4x^2+32x+64$

$\boxed{x^3+12x^2+48x+64}$

Cube of a Binomial

$$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$$

$$(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$$

11. Multiply $(4b - 7)^3$.

12. Multiply $(5y + 3)^3$.