

4.3 SCIENTIFIC NOTATION

p. 273

$$a \times 10^n$$

WHERE $1 \leq a < 10$ AND n IS AN INTEGER

$$10^1 (5.32) = 53.2$$

$$100 (5.32) = 10^2 (5.32) = 532$$

$$1000 (5.32) = 10^3 (5.32) = 5320$$

REMEMBER $10^{-1} = \frac{1}{10}$ $10^{-2} = \frac{1}{10^2} = \frac{1}{100}$

$$\frac{1}{10} (5.32) = 10^{-1} (5.32) = 0.532$$

$$\frac{1}{100} (5.32) = 10^{-2} (5.32) = 0.0532$$

$$\frac{1}{1000} (5.32) = 10^{-3} (5.32) = 0.00532$$

Ex. 1

(a) $7.02 \times 10^6 = 7,020,000.$

(b) $8.13 \times 10^{-5} = 0.0000813$

(c) $9.0 \times 10^{-6} = 0.000009$

Ex. 2

(a) $\underline{7.346200} = 7.3462 \times 10^6$

(b) $0.0000348 = 3.48 \times 10^{-5}$

(c) $\underline{135} \times 10^{-12} = 1.35 \times 10^{-10}$

$$\frac{135 \times 10^{-12}}{1.35 \times 10^2 \times 10^{-12}} = 1.35 \times 10^{-10}$$

Ex. 3 $327,000 = 3.27 \times 10^5$
② $327 \text{ THOUSAND} = 327 \times 10^3$
 $= 3.27 \times 10^2 \times 10^3 = 3.27 \times 10^5$

$$327 = 3.27 \times 100 = 3.27 \times 10^2$$

⑥ $3788 \text{ MILLION} = 3788000000$
 $= 3788 \times 10^6$
 $= 3.788 \times 10^9$

③ $0.5 \text{ BILLION} = 500,000,000$
 $\underset{10^9}{=} .5 \times 10^9$
 $= 5 \times 10^8$

④ $16.5 \text{ TRILLION} = 16,500,000,000,000$
 $\underset{10^{12}}{=} 16.5 \times 10^{12}$
 $= 1.65 \times 10^{13}$

Ex. 4

$$\textcircled{a} (3 \times 10^6)(2 \times 10^8) = 3 \cdot 2 \cdot 10^6 \cdot 10^8 \\ 6 \times 10^{14}$$

$$\textcircled{b} \frac{4 \times 10^5}{(8 \times 10^{-2})} = 0.5 \times 10^7 = 5 \times 10^6$$

$$\textcircled{c} (5 \times 10^{-7})^3 = 125 \cdot 10^{-21} = 1.25 \times 10^{-19}$$

Ex. 5

Ⓐ $(3000000)(0.0002)$

$$(3 \times 10^6)(2 \times 10^{-4}) = 6 \times 10^2 = 600$$

Ⓑ $(20,000,000)^3 (0.0000003)$

$$(2 \times 10^7)^3 (3 \times 10^{-7})$$

$$(8 \times 10^{21})(3 \times 10^{-7}) = 24 \times 10^{14} = 2.5 \times 10^{15}$$

2,500,000,000,000,000

4.4. ADDITION & SUBTRACTION OF POLYNOMIALS.

$$4x^{\textcircled{3}} - 15x^2 + x + \textcircled{2}$$

CONSTANT TERM
(NO VAR - OR VAR⁰)

TERMS: NAMED BY THEIR VARIABLES & EXPONENTS

POLYNOMIAL: SINGLE TERM OR FINITE SUM OF TERMS

DEGREE: HIGHEST EXPONENT

NAMED BY NUMBER
OF TERMS: MONOMIALS,
BINOMIALS, TRINOMIALS,
POLYNOMIALS

TERMS MUST BE SEPARATED BY + OR -

└ CAN HAVE A VARIABLE, CAN HAVE A COEFFICIENT

Ex. 1

(a) $-x^3 + 5x^2 - 6$

COEF OF x^3 IS 1
" " x^2 IS 5

(b) $4x^6 - x^3 + x$

COEF OF x^3 IS -1
" " x^2 IS 0

Ex. 2

(a) $5x^2 - 7x^{\textcircled{3}} + 2$ TRINOMIAL (3 TERMS)
DEGREE: 3

(b) $x^{43} - x^2$ BINOMIAL (2 TERMS)
DEGREE: 43

(c) $5x^1$ MONOMIAL (1 TERM)
DEGREE: 1

(d) -12 MONOMIAL (1 TERM) $-12x^0$
DEGREE: 0

EX. 3

(a) $-3x^4 - x^3 + 20x + 3$ at $x = -2$

$$-3(-2)^4 - (-2)^3 + 20(-2) + 3$$

$$-3(16) - (-8) + (-40) + 3$$

$$-48 + 8 - 40 + 3$$

$$-88 + 11$$

$$-77$$

JUST FOLLOW
ORDER OF
OPERATIONS

EX. 4

FUNCTION NOTATION

(a)

$$P(x) = -3x^4 - x^3 + 20x + 3$$

VARIABLE

FUNCTION
DEFINITION

FUNCTION
NAME

$$P(1) = -3(1)^4 - (1)^3 + 20(1) + 3$$

$$= -3 - 1 + 20 + 3 = 19$$

Ex. 6

$$\textcircled{b} (4y^3 - 3y + 2) - (5y^2 - 7y - 6)$$

$$4y^3 - 3y + 2 - 5y^2 + 7y + 6$$

$$4y^3 - 5y^2 + 4y + 8$$