

$$8. \quad (a) \quad \sigma_w\left(2x + \frac{n}{6}\right) + \sigma_w\left(x + \frac{n}{3}\right) = 0$$

$$\sigma_w\left(2x + \frac{n}{6}\right) = -\sigma_w\left(x + \frac{n}{3}\right)$$

$$\sigma_w\left(2x + \frac{n}{6}\right) = \sigma_w\left(n + x + \frac{n}{3}\right)$$

$$2x + \frac{n}{6} = 2kn + n + x + \frac{n}{3} \quad \vee \quad 2x + \frac{n}{6} = 2kn - n - x - \frac{n}{3}$$

$$x = 2kn + n + \frac{n}{3} - \frac{n}{6}$$

$$3x = 2kn - n - \frac{n}{3} - \frac{n}{6}$$

$$x = 2kn + \frac{7n}{6}$$

$$3x = 2kn - \frac{9n}{6}$$

$$x = \frac{2kn}{3} - \frac{3n}{6}$$

$$x = \frac{2kn}{3} - \frac{n}{2}$$

$$(B) \quad \varepsilon\psi\left(\frac{n}{3}-x\right) - \sigma\psi\left(2x+\frac{n}{4}\right) = 0$$

$$\varepsilon\psi\left(\frac{n}{3}-x\right) = \sigma\psi\left(2x+\frac{n}{4}\right)$$

$$\varepsilon\psi\left(\frac{n}{3}-x\right) = \varepsilon\psi\left(\frac{n}{2}-2x-\frac{n}{4}\right)$$

$$\frac{n}{3}-x = kn + \frac{n}{2}-2x-\frac{n}{4}$$

$$x = kn + \frac{n}{2} - \frac{n}{4} - \frac{n}{3}$$

$$x = kn - \frac{n}{3}$$

$$\textcircled{1} \quad 2\sigma\omega\left(2x + \frac{n}{6}\right) + \sqrt{3} = 0 \quad (-n, n)$$

$$\sigma\omega\left(2x + \frac{n}{6}\right) = -\frac{\sqrt{3}}{2}$$

$$\sigma\omega\left(2x + \frac{n}{6}\right) = -\sigma\omega \frac{n}{6}$$

$$\sigma\omega\left(2x + \frac{n}{6}\right) = \sigma\omega\left(n - \frac{n}{6}\right)$$

$$\sigma\omega\left(2x + \frac{n}{6}\right) = \sigma\omega \frac{5n}{6}$$

$$2x + \frac{n}{6} = 2kn + \frac{5n}{6}$$

$$2x = 2kn + \frac{4n}{6}$$

$$x = kn + \frac{n}{3}$$

$$-n < x < n$$

$$-n < kn + \frac{n}{3} < n$$

$$-1 < k + \frac{1}{3} < 1$$

$$-\frac{4}{3} < k < \frac{2}{3}$$

$$k=0$$

$$2x + \frac{n}{6} = 2kn - \frac{n}{6}$$

$$2x = 2kn - \frac{2n}{6}$$

$$x = kn - \frac{n}{3}$$

$$-n < x < n$$

$$x = -\frac{n}{3} - n < kn - \frac{n}{3} < n$$

$$-1 < k - \frac{1}{3} < 1$$

$$-\frac{2}{3} < k < \frac{4}{3}$$

$$k=0$$

$$k=1$$

$$x = \frac{n}{3}$$

$$x = \frac{2n}{3}$$

$$\varepsilon \varphi X = \sqrt{3}$$

$$\left[0, \frac{n}{2}\right]$$

$$\varepsilon \varphi X = \varepsilon \varphi \frac{n}{3}$$

$$X = kn + \frac{n}{3}$$

$$0 \leq X \leq \frac{n}{2}$$

$$0 \leq kn + \frac{n}{3} \leq \frac{n}{2}$$

$$0 \leq k + \frac{1}{3} \leq \frac{1}{2}$$

$$-\frac{1}{3} \leq k \leq \frac{1}{2} + \frac{1}{3}$$

$$-\frac{1}{3} \leq k \leq \frac{1}{6}$$

$$\underline{\underline{k = 0}}$$

$$\underline{\underline{X = \frac{n}{3}}}$$

Exercice 18

1. (a) $x^5 = 16x$

$$x^5 - 16x = 0$$

$$x(x^4 - 16) = 0$$

$$x = 0$$

$$x^4 - 16 = 0$$

$$x^4 = 16$$

$$x^2 = 4$$

$$x^2 = -4$$

Aussu

$$x = 2$$

$$x = -2$$

2. (b) $x^3 - 2x^2 - 25x + 50 = 0$

$$x^2(x-2) - 25(x-2) = 0$$

$$(x-2)(x^2 - 25) = 0$$

$$x = 2$$

$$x^2 - 25 = 0$$

$$(x-5)(x+5) = 0$$

$$x = 5$$

$$x = -5$$

3. (B) $3x^5 - 2x^4 - 3x + 2 = 0.$

$$x^4(3x-2) - (3x-2) = 0$$

$$(3x-2)(x^4-1) = 0$$

$$3x-2=0$$

$$x = \frac{2}{3}$$

$$x^4-1=0$$

$$x^4=1$$

$$x=1 \quad x=-1$$

4. (B) $x^3 - 6x + 5 = 0.$

5

$$\pm 1 \quad \pm 5$$

$$\textcircled{1} \checkmark \quad \textcircled{-1} \quad \textcircled{5} \quad \textcircled{-5}$$

(D) $x^4 - 3x^3 + 6x - 4 = 0$

$$\frac{-4}{\pm 1 \quad \pm 2 \quad \pm 4}$$

$$\textcircled{1} \checkmark \quad \textcircled{-1} \quad \textcircled{2} \quad \textcircled{-2}$$

6. (B) $2x^3 - x - 1 = 0$

$$\frac{-1}{\pm 1}$$

$$\begin{array}{cccc} 2 & 0 & -1 & -1 & (1) \\ \downarrow & 2 & 2 & 1 & \\ 2 & 2 & 1 & 0 & \end{array}$$

$$(x - 1)(2x^2 + 2x + 1) = 0$$

$$x - 1 = 0$$

$$\therefore 2x^2 + 2x + 1 = 0$$

$$(x = 1)$$

$$\Delta < 0$$

Answer.

10. ② $f(x) = x^3 - 2x^2 - 5x + 6$.

$$f(x) = 0$$

$$x^3 - 2x^2 - 5x + 6 = 0$$

$$\begin{array}{cccc} 1 & -2 & -5 & 6 & \textcircled{1} \\ \downarrow & & & & \\ & 1 & -1 & -6 & \\ \downarrow & & & & \\ 1 & -1 & -6 & 0 & \end{array}$$

$$(x-1)(x^2 - x - 6) = 0$$

$$\begin{array}{ccc} 1 & -1 & -6 & \textcircled{3} \\ \downarrow & & & \\ & 3 & 6 & \\ \downarrow & & & \\ 1 & 2 & 0 & \end{array}$$

$$(x-1)(x-3)(x+2) = 0$$

$$\begin{array}{lcl} x-1=0 & \text{or} & x-3=0 & \text{or} & x+2=0 \\ x=1 & & x=3 & & x=-2 \end{array}$$

6.

⑧

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

$$x^3 + 3 = 2x - 2x^2$$

$$x^3 + 2x^2 - 2x + 3 = 0$$

$$\begin{array}{r|rrrr} 1 & 2 & -2 & 3 & 0 \\ & -3 & +3 & -3 & \\ \hline 1 & -1 & 1 & 0 & \end{array} \quad (-3)$$

$$(x-3) \cdot (x^2 + x + 1) = 0$$

$$x-3=0$$

$$x=3$$

n

$$x^2 + x + 1 = 0$$

$$\Delta < 0$$

odmaza

11.

$$\textcircled{B} f(x) = x^3 - 6x$$

$$g(x) = x - 6$$

$$x(x^2 - 6) = 0$$

$$x=0 \quad \text{h} \quad x^2 - 6 = 0$$

$$x = \pm\sqrt{6}$$

$$f(x) = g(x)$$

$$x^3 - 6x = x - 6$$

$$x^3 - 7x + 6 = 0$$

$$\begin{array}{r} 6 \\ \pm 1 \pm 2 \pm 3 \pm 6 \end{array}$$

$$\begin{array}{r|rrrr} 1 & 0 & -7 & 6 & 0 \\ & -7 & +6 & -6 & \\ \hline 1 & -7 & 1 & 0 & \end{array}$$

$$\begin{array}{r|rrrr} 1 & 0 & -7 & 6 & 0 \\ & 1 & 1 & -6 & \\ \hline 1 & 1 & -6 & 0 & \end{array} \quad (1)$$

$$(x-1)(x^2+x-6) = 0$$

$$x=1$$

$$x=-3$$

$$x=2$$

8. (B) $\frac{2}{15}x^3 + \frac{1}{3}x^2 - \frac{4}{15}x - \frac{1}{5} = 0.$

$$2x^3 + 5x^2 - 4x - 3 = 0$$

$$\frac{-3}{\pm 1 \pm 3}$$

$$2 \quad 5 \quad -4 \quad -3 \quad (1)$$

$$\downarrow \quad 2 \quad 7 \quad 3$$

$$2 \quad 7 \quad 3 \quad 0$$

$$(x-1)(2x^2 + 7x + 3) = 0$$

$$x = 1$$

$$2x^2 + 7x + 3$$

$$\Delta = 49 - 24 = 25$$

$$x_{1,2} = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-7 \pm \sqrt{25}}{4}$$

$$x_1 = \frac{-7+5}{4} = -\frac{2}{4} = -\frac{1}{2}$$

$$x_2 = \frac{-7-5}{4} = -\frac{12}{4} = -3$$

Εργασία Μαθητή

18

① $αβγ$

② $αγε$

③ $α.$

④ $αγ$

⑤ $α.$

⑥ $αγ$

⑦ $α.$

⑧ $α.$