

1. $P(x) = x^3 - mx^2 + mx - n + 3$

$P(x) = (x^2 - 4) B(x)$

$x^3 - m.x^2 + mx - n + 3 = (x - 2)(x + 2).B(x)$

$x = 2$ için

$2^3 - m.2^2 + m.2 - n + 3 = 0 \Rightarrow 8 - 4m + 2m - n + 3 = 0$

$11 = 2m + n$

$x = -2$ için

$(-2)^3 - m(-2)^2 + m(-2) - n + 3 = 0 \Rightarrow -8 - 4m - 2m - n + 3 = 0$

$-5 = 6m + n$

$11 = 2m + n \rightarrow 11 = 2(-4) + n$

$-5 = 6m + n \quad 11 = -8 + n$

$16 = -4m$

$19 = n$

$-4 = m$

$n - m = 19 - (-4) = 23$

Cevap: E

2.
$$\begin{array}{r} x^5 - 3x^3 - x \\ - x^5 + 2x^3 \\ \hline -5x^3 - x \\ - -5x^3 - 10x \\ \hline 9x \end{array} \quad \begin{array}{l} x^2 + 2 \\ x^3 - 5x \end{array}$$

$Q(x) = x^3 - 5x$

Cevap: E

3. $x^3 + mx - 2 = (x - 1)P(x)$

$x = 1$ için

$1^3 + m.1 - 2 = 0$

$m = 1$

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

$\frac{x^3 + x - 2}{x - 1} = P(x)$

$P(2) = \frac{2^3 + 2 - 2}{2 - 1} = \frac{8}{1} = 8$

Cevap: A

4. $P(x) = (x - 1)(x - 2)(x - 4)$

$$\begin{array}{r} P(x + 1) \mid x + 2 \\ - \\ \hline k \end{array}$$

$x + 2 = 0$

$x = -2$

$P(x + 1)$ için $x = -2$ yazalım

$P(-2 + 1) = P(-1) = k$ 'dir.

$P(-1) : (-1 - 1)(-1 - 2)(-1 - 4) = k$

$= (-2)(-3)(-5) = -30 = k$

Cevap: E

5. $f(x) = x^2 + x + m$

$f(x_1) = f(x_2) = 0$

$x_1 = 2x_2$ ise $x_1 + x_2 = -1$

$2x_2 + x_2 = -1$

$x_2 = -\frac{1}{3}$

$f\left(-\frac{1}{3}\right) = \left(-\frac{1}{3}\right)^2 - \frac{1}{3} + m = 0$

$= \frac{1}{9} - \frac{1}{3} + m = 0$

$m = \frac{2}{9}$

Cevap: E

6. $P(x) = ax^5 + bx^4 + 1$

$$\begin{array}{r} P(x) \mid (x-1)^2 \\ - \\ \hline \\ \\ \hline 0 \end{array}$$

$a.x^5 + b.x^4 + 1 = (x-1)^2.Q(x)$

$x = 1$ alalım.

$a + b + 1 = 0$

$a.x^5 + b.x^4 + 1 = (x-1)^2.Q(x)$ ifadesinde her iki tarafın türevini alalım.

$5.a.x^4 + 4.b.x^3 = 2(x-1).Q(x) + Q(x).2(x-1)^2$

$x = 1$ alalım.

$5a + 4b = 0$

$$\left. \begin{array}{l} 5a = -4b \\ \downarrow \downarrow \\ -4k 5k \end{array} \right\} a + b + 1 = -4k + 5k + 1 = 0$$

$$\boxed{k = -1}$$

$$a = -4k = -4(-1) = 4$$

Cevap: B

7. $P(x) = ax - 4$

$Q(x) = 7x - b - 2$

$P(x-2) = a(x-2) - 4 = ax - 2a - 4$

$$Q(4-3x) = 7(4-3x) - b - 2 = 28 - 21x - b - 2$$

$$= -21x + 26 - b$$

$ax - 2a - 4 = -21x + 26 - b$

$$\left. \begin{array}{l} a = -21 \\ -2a - 4 = 26 - b \\ -2(-21) - 4 = 26 - b \\ b = 26 + 4 - 42 = -12 \end{array} \right\} a + b = -21 - 12$$

$$= -33$$

Cevap: A

8. $P(x) = -3x^3 + 4.x^2 - ax + 6$

$P(2) = -4$

$P(2) = -4 = -3.2^3 + 4.2^2 - 2a + 6$

$-4 = -24 + 16 - 2a + 6$

$2a = -24 + 16 + 6 + 4$

$2a = 2$

$a = 1$

$P(-1) = -3(-1)^3 + 4(-1)^2 - 1.(-1) + 6$

$= 3 + 4 + 1 + 6 = 14$

Cevap: D

9. $\frac{P(x+3)}{Q(2x-1)} = -x^3 + 4x + 9$

$Q(3) = 2$

$P(5) = ?$

$x = 2$ alalım.

$$\frac{P(5)}{Q(3)} = -2^2 + 4.2 + 9$$

$$\frac{P(5)}{2} = -8 + 8 + 9$$

$P(5) = 18$

Cevap: D

10. $P(x) = (x-2)(x-3) B(x) + ax + b$

$P(2) = 5$

$P(3) = 8$

$P(2) = 0 + 2a + b \Rightarrow 5 = 2a + b$

$P(3) = 0 + 3a + b \Rightarrow -8 = 3a + b$

$-3 = -a$

$\boxed{a = 3}$

$5 = 2.a + b$

$5 = 2.3 + b \Rightarrow a.b = 3.(-1) = -3$

$\boxed{-1 = b}$

Cevap: A

11. $P(x) = 7x^3 - 2x^2 + 3x + 5$

$Q(x) = x^3 - x^2$

$$P(x).Q(x) = (7x^3 - 2x^2 + 3x + 5)(x^3 - x^2)$$

$$= 7x^6 - 7x^5 - 2x^5 + 2x^4 + 3x^4 - 3x^3 + 5x^3 - 5x^2$$

$a_5 = -9$

Cevap: A

12.
$$\begin{array}{r|l} P(3x+1) & x+2 \\ \hline & x+2=0 \\ & x=-2 \end{array}$$

$P(3(-2) + 1) = P(-5) = ?$

$$P(-5) = 4(-5)^2 - (-5) + 12$$

$$= 4.25 + 5 + 12$$

$$= 117$$

Cevap: C

13. $x^2 + (m^2 - 16)x - 2 + m = 0$

$x_1 + x_2 = 0$

$x_1 + x_2 = -m^2 + 16 = 0$

$m^2 = 16$

$m = 4$ için $x^2 - 2 + 4 = 0 \rightarrow x^2 = -2$ olmaz!

$m = -4$ olur.

Cevap: A

14.
$$\begin{array}{r|l} P(x) & x+1 \\ \hline - & A(x) \\ -6 & \end{array} \quad \begin{array}{r|l} P(x) & x-2 \\ \hline - & B(x) \\ 6 & \end{array}$$

$P(-1) = -6$

$P(2) = 6$

$$\begin{array}{r|l} P(x) & (x+1)(x-2) \\ \hline - & C(x) \\ ax+b & \end{array}$$

$P(x) = (x+1)(x-2).c(x) + ax + b$

$P(-1) = -a + b = -6 \Rightarrow -4 + b = -6$

$P(2) = -2a + b = 6 \Rightarrow b = -2$

$-3a = -12$

$a = 4$

$ax + b = 4x - 2$

Cevap: B

15. $A = 3x^3 + 2x^2 + ax - 1$

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

$A.B = \dots + 12.x^4 - 2(2a + 1).x^4 + \dots$

$= x^4(12 - 4a - 2)$

$= x^4(10 - 4a)$

$10 - 4a = 2$

$a = 2$

Cevap: C

16. $f(x) = mx^2 + 6x - n$

$x_1 = x_2 \Rightarrow \Delta = 0$

$\Delta = 6^2 - 4.m(-n) = 0$

$= 36 + 4mn = 0$

$= 4mn = -36$

$mn = -9$

Cevap: C

17. $x = -2$ için, $P(-3) = k$

$x = -1$ için, $P(2(-1) - 1) = 2.(-1)^3 - 2(-2)^2 + 3(-1) + 4$

$P(-3) = -2 - 2 - 3 + 4 = k$

$-3 = k$

Cevap: B

18. $4.x^3 - 3x^2 + 5 + x.P(x) = 3x^3 - x^2 + 5$

$x.P(x) = -x^3 + 2x^2$

$P(x) = -x^2 + 2x$

Cevap: D

19. $x - 2 = 0 \Rightarrow x = 2$

$$\begin{aligned} P(2) &= 3 \cdot 2^3 - 2 \cdot 2^2 + 2 + 3 \\ &= 3 \cdot 8 - 2 \cdot 4 + 2 + 3 \\ &= 24 - 8 + 2 + 3 \\ &= 21 \end{aligned}$$

Cevap: A

20. $f(x) = x^2 - (2 - \sqrt{2})x - \sqrt{8}$

$$\begin{aligned} x_1^3 + x_2^3 &= (x_1 + x_2)^3 - 3 \cdot x_1 \cdot x_2 (x_1 + x_2) \\ &= (2 - \sqrt{2})^3 + 3\sqrt{8}(2 - \sqrt{2}) \\ &= (2 - \sqrt{2})((2 - \sqrt{2})^2 + 6\sqrt{2}) \\ &= (2 - \sqrt{2})(4 - 4\sqrt{2} + 2 + 6\sqrt{2}) \\ &= (2 - \sqrt{2})(6 + 2\sqrt{2}) \\ &= 12 + 4\sqrt{2} - 6\sqrt{2} - 4 \\ &= 8 - 2\sqrt{2} \end{aligned}$$

Cevap: D