

Fonksiyon 3

1) $f : A \rightarrow B$ ye $f(x) = \begin{cases} 2 - mx, & x < 2 \\ \frac{mx + n}{x - 1}, & x \geq 2 \end{cases}$ ile tanımlı
 $f(1) = 1$ ve $f(3) = 2$ ise $m + n = ?$
 a)1 b)2 c)3 d)4 e)5

Çöz:1/b/

$$x < 2 \text{ için } f(x) = 2 - mx$$

$$f(1) = 2 - m = 1; m = 1$$

$$z \geq 2 \text{ için } f(x) = \frac{mx + n}{x - 1} = \frac{n + x}{x - 1} = \frac{3 + n}{3 - 1} = 2$$

$$n = 1, m + n = 1 + 1 = 2$$

2) $f(2x + 3) = \frac{2x + m}{x + 5}$ ve $f^{-1}(m) = 7$ ise $m = ?$

a) $\frac{3}{2}$ b) $\frac{3}{4}$ c) $\frac{2}{3}$ d) $\frac{6}{5}$ e) $-\frac{3}{2}$

Çöz:2/c/ $f^{-1}(m) = 7 \rightarrow f(7) = m$

$$2x + 3 = 7; x = 2$$

$$f(7) = \frac{2 \cdot 2 + m}{2 + 5} = m$$

$$6m = 4 \rightarrow m = \frac{2}{3}$$

3) $f(x)$ tek fonksiyon olmak üzere $f(x) = f(-x) + x^3$ ise $f^{-1}(4) = ?$

a)1 b)2 c)3 d)4 e)5

Çöz:3/c/ $f(x) = -f(x) + x^3$ tek fon

$$f(x) = -f(x) + x^3 \rightarrow 2f(x) = x^3$$

$$f(x) = \frac{x^3}{2}; f^{-1}(4) = x \rightarrow f(x) = 4; x = 2$$

4) Reel sayılarda tanımlı f ve g fonk. için
 $(f^{-1} \circ g)_{(x+1)} = 3x + 4$ ve $g(x) = 2x - 3$ ise $f(1) = ?$

a)1 b)2 c)3 d)-3 e)5

Çöz:4/d/ $(f^{-1} \circ g)_{(x+1)} = 3x + 4$ için

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

$$f^{-1}(2x - 1) = 3x + 4 \rightarrow f(3x + 4) = 2x - 1$$

$$f(1) = -3$$

5) $f : R \rightarrow R; f(x) = x^3 - 3x^2 + 3x + 1$ tanımlanan
 $f(x)$ ise $f(1 + \sqrt[3]{5}) = ?$

a)7 b)12 c)13 d)-13 e)50

Çöz:5/a/ $f(x) = x^3 - 3x^2 + 3x + 1 = (x - 1)^2 + 2$

$$f(1 + \sqrt[3]{5}) = (1 + \sqrt[3]{5} - 1)^2 + 2 = 5 + 2 = 7$$

6) $f : R \rightarrow R; f(x) = \sqrt[3]{3x - 1}$ ve $f^{-1}(a) = 3$ ise $a = ?$

a)1 b)2 c)3 d)-3 e)5

Çöz:6/b/ $y = f(x) \Rightarrow f^{-1}(y) = x$

$$f^{-1}(a) = 3 \rightarrow f(3) = a \Rightarrow f(x) = \sqrt[3]{3x - 1}$$

$$f(3) = \sqrt[3]{8} \rightarrow a = 2$$

7) $f(x) = \frac{1 + x}{1 - x}$ ise $f(2x)$ in $f(x)$ cinsinden değeri nedir?

a) $\frac{3f(x) - 2}{3 - f(x)}$ b) $\frac{3f(x) - 3}{3 - f(x)}$ ac) $\frac{3f(x) - 1}{3 - f(x)}$

d) $\frac{3f(x) - 2}{3 + f(x)}$ e) $\frac{3f(x) - 2}{3 + 3f(x)}$

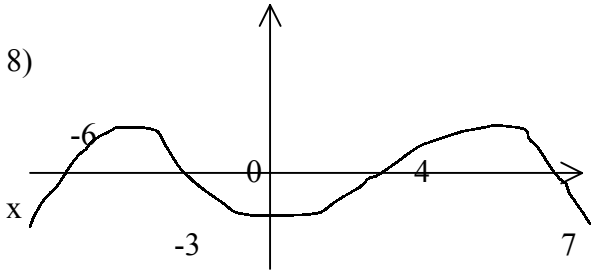
Çöz:7/c/ $f(2x) = \frac{1 + 2x}{1 - 2x}$

$$f(x) = \frac{1 + x}{1 - x} \rightarrow f(x)(1 - x) = 1 + x; f(x) - xf(x) = 1 + x$$

$$f(x) - 1 = x(1 + f(x)); x = \frac{f(x) - 1}{1 + f(x)}$$

$$f(2x) = \frac{1 + 2 \cdot \frac{f(x) - 1}{1 + f(x)}}{1 - 2 \cdot \frac{f(x) - 1}{1 + f(x)}} = \frac{3f(x) - 1}{3 - f(x)}$$

8)



$y=f(x)$ fonksiyon grafiğinde $f(x) < 0$ koşulunu sağlayan x tamsayılarının toplamı kaçtır?

a)1 b)2 c)3 d)-3 e)-4

Çöz:8/ e / $(-\infty, -6) + (-3, 4) + (7, +\infty)$

$$\dots -9 -8 -7 -2 -10 +1 +2 +3 +8 +9 + \dots = -4$$

9) $g(x) = x^2 + 2$ $(f \circ g)_{(x)} = 2x^4 + 8x^2 + 7$

ise $f(x) = ?$

a) $3x^3 - 1$ b) $3x^2 + 1$ c) $2x^3 - 1$

d) $2x^3 - 2$ e) $2x^2 - 1$

Çöz:9/ e / $f \circ g \circ g^{-1} = (2x^4 + 8x^2 + 7) \circ (\sqrt{x-2})$

$$= 2(x-2)^2 + 8(x-2) + 7$$

$$2x^2 - 8x + 8 + 8x - 16 + 7 = 2x^2 - 1$$

10) $f(x-1) + f(x+1) = 6x - 4$ ise $f(7) = ?$

a)19 b)21 c)33 d)-33 e)-40

Çöz:10/ a / $f(x) = ax + b$ olsun

$$f[a(x-1) + b] + f[a(x+1)] = 6x - 4$$

$$ax - a + b + ax + a + b = 6x - 4$$

$$2ax + 2b = 6x - 4$$

$$ax + b = 3x - 2 \rightarrow f(x) = ax + b$$

$$f(x) = 3x - 2 \rightarrow f(7) = 19$$

11) $f(x) = 3x + 5$ ise $f(2x+3)$ 'ün $f(x)$ cinsinden değeri kaçtır?

a) $2f(x) - 4$ b) $3f(x) - 4$ c) $2f(x) + 4$

d) $f(x) - 4$ e) $4f(x) - 4$

Çöz:11/ c/:

$$f(2x+3) = 3(2x+3) + 5 = 6x + 9 + 5$$

$$= 6x + 10 + 4 = 2(3x + 5) + 4 = 2f(x) + 4$$

12) $f\left(\frac{x-3}{2}\right) = 3x + 1$ ise $f(x) = ?$

a) $2x - 4$ b) $3x - 4$ c) $2x + 4$ d) $6x + 10$ e) $6x - 10$

Çöz: 12 / d / $f\left(\frac{x-3}{2}\right) = 3x + 1$ ise $f^{-1}(x) = 2x + 3$

$$f(x) = 3(2x + 3) + 1 = 6x + 10$$

13)

$f(x) = mx + n$, $f^{-1}(6) = 2$ ve $f^{-1}(3) = 8$ ise $m.n = ?$

a) $\frac{2}{7}$ b) $-\frac{2}{7}$ c) $\frac{5}{7}$ d) $-\frac{5}{7}$ e) $-\frac{7}{2}$

Çöz: 13 / e / $f(2) = 6$, $f(8) = 3$

$$f(x) = mx + n$$

$$f(2) = 2m + n = 6$$

$$f(8) = 8m + n = 3$$

$$m = -\frac{1}{2}; n = 7 \rightarrow m.n = -\frac{7}{2}$$

14) $f(x+3) = x^3 - 3x^2 + 3x - 1$ ise $f^{-1}(x) = ?$

a) $\sqrt[3]{x} - 3$ b) $\sqrt[3]{x} + 4$ c) $\sqrt[3]{x} + 3$

d) $\sqrt[3]{x} - 4$ e) $\sqrt[3]{x} - 2$

Çöz:14/b/

$$f(x+3) = x^3 - 3x^2 + 3x - 1 \text{ ise } f(x+3) = (x-1)^3$$

$$f(x+3-3) = (x-1-4) \rightarrow f(x) = (x-4)^3$$

$$f(x) = y = (x-4)^3, x = (y-4)^3$$

$$\sqrt[3]{x} + 4 = y \rightarrow f^{-1}(x) = \sqrt[3]{x} + 4$$