

نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره کلاس
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$$f(x) = (a+b)(\sqrt{x}) = \sqrt{x}a + \sqrt{x}b$$

$$f(-1) = \sqrt{-1}a - \sqrt{-1}b$$

$$\sqrt{x}(a+b) = \sqrt{x}a + \sqrt{x}b \rightarrow \sqrt{x}a + \sqrt{x}b = \sqrt{x}a - \sqrt{x}b \rightarrow 10a = -10 \rightarrow a = -1, 1$$

1

$$\begin{aligned} \sqrt{x} - \sqrt{y} &= \frac{1}{\sqrt{x} + \sqrt{y}} \xrightarrow{\sqrt{x} - \sqrt{y} = a} f(a) + f\left(\frac{1}{a}\right) = \sqrt{a} + \frac{1}{\sqrt{a}} + \sqrt{\frac{1}{a}} + \sqrt{a} + \sqrt{y} \\ &= \sqrt{a} + \frac{1}{\sqrt{a}} + \sqrt{y} = \sqrt{a} + \frac{1}{\sqrt{a}} + \sqrt{y} = \sqrt{a} + \frac{1}{\sqrt{a}} + \sqrt{y} \\ &= \sqrt{a} + \frac{1}{\sqrt{a}} + \sqrt{y} = \sqrt{a} + \frac{1}{\sqrt{a}} + \sqrt{y} = \sqrt{a} + \frac{1}{\sqrt{a}} + \sqrt{y} \\ &= \sqrt{a} + \frac{1}{\sqrt{a}} + \sqrt{y} = \sqrt{a} + \frac{1}{\sqrt{a}} + \sqrt{y} = \sqrt{a} + \frac{1}{\sqrt{a}} + \sqrt{y} \end{aligned}$$

2

$$\begin{aligned} n=1 &\rightarrow \sqrt{x}f(x) - \sqrt{x}f(-x) = \sqrt{x}x^2 - x \rightarrow \sqrt{x}f(x) - \sqrt{x}f(-x) = 10x^2 - 10x \\ n=-1 &\rightarrow \sqrt{x}f(-x) - \sqrt{x}f(x) = \sqrt{x}x^2 + x \rightarrow \sqrt{x}f(-x) - \sqrt{x}f(x) = 10x^2 + 10x \\ &\quad - \Delta f(x) = 10x^2 + 10x \\ &\quad \Delta f(x) = -10x^2 - 10x \\ &\quad f(x) = -5x^2 - \frac{1}{5}x \end{aligned}$$

3

$$\begin{aligned} n=-2 &\rightarrow \sqrt{x}f(x) = 10 + 10m + 10n - 1 = 10 + 10m \rightarrow f(x) = \frac{10 + 10m}{\sqrt{x}} \\ n=0 &\rightarrow \sqrt{x}f(x) = 10m - 1 \rightarrow f(x) = \frac{10m - 1}{\sqrt{x}} \\ \frac{10 + 10m}{\sqrt{x}} &= \frac{10m - 1}{\sqrt{x}} \rightarrow 10 + 10m = 10m - 1 \rightarrow 10 = -1 \rightarrow m = 10 \\ f(x) &= \frac{10m - 1}{\sqrt{x}} = \frac{10 \times 10 - 1}{\sqrt{x}} = 99, 10 \end{aligned}$$

4

$$\begin{aligned} f(-1) + f(-1) &= \frac{10 + 10 + 10}{-1} \rightarrow \sqrt{x}f(-1) = -10 \rightarrow f(-1) = -9 \\ f(x) &= 10x - 9 \end{aligned}$$

5

$D_f = 1-x \geq 0 \rightarrow 1 \geq x$ $D_g = (1-x)^2 \geq 0 \rightarrow 1-x \geq 0 \rightarrow 1 \geq x$ $f(x) = -(1-x)\sqrt{1-x} \rightarrow -\sqrt{(1-x)^2} \sqrt{1-x} \rightarrow -\sqrt{(1-x)^3} = g(x)$	$\{ D_f = D_g \Rightarrow$ دو تابع مساوی اند در بازه $x \in [0, 1]$	۶
$D_f = x \geq 0$ $D_g = x^3 \geq 0 \rightarrow x \geq 0$ $f(x) = x\sqrt{x} \rightarrow \sqrt{x^2} \sqrt{x} \rightarrow \sqrt{x^3} \Rightarrow g(x)$	$\{ D_f = D_g \Rightarrow$ دو تابع برابرند در بازه $x \in [0, \infty)$	۷
$D_f = x \geq 0$ $D_g \Rightarrow x - x \geq 0 \rightarrow x \leq x $	$y = x$ $y = x $  با توجه به شکل نقاط از $x \geq 0$ اتفاق می افتد $\leftarrow D_f = D_g \leftarrow$ دو تابع برابرند	۸
الف) $\left(\frac{1+i}{1-i}\right) = 3$ ب) $\frac{3+3i}{3-3i} = \frac{y}{0} \rightarrow$ تعریف نشده ج) $0 \times 1 = 0$	$f \circ g = 3$	۹
الف) $\begin{cases} 3x-1=2 \rightarrow x=1 \rightarrow g(1)=f(2)=1 \\ 3x-1=-1 \rightarrow x=0 \rightarrow g(0)=f(-1)=4 \\ 3x-1=0 \rightarrow x=\frac{1}{3} \rightarrow g(\frac{1}{3})=f(0)=2 \\ 3x-1=-2 \rightarrow x=-\frac{1}{3} \rightarrow g(-\frac{1}{3})=f(-2)=2 \end{cases}$ $h(x) = \begin{cases} x =2 \rightarrow x=\pm 2 \rightarrow h(2)=f(2)=1 \\ x =1 \rightarrow x=\pm 1 \rightarrow h(-1)=f(1)=1 \\ x =0 \rightarrow x=0 \rightarrow h(0)=f(0)=2 \\ x =-2 \rightarrow x=\pm 2 \rightarrow h(2)=f(2)=1 \\ x =3 \rightarrow x=\pm 3 \rightarrow h(3)=f(3)=1 \end{cases}$ ب) $\begin{cases} x =2 \rightarrow x=\pm 2 \rightarrow h(2)=f(2)=1 \\ x =1 \rightarrow x=\pm 1 \rightarrow h(-1)=f(1)=1 \\ x =0 \rightarrow x=0 \rightarrow h(0)=f(0)=2 \\ x =-2 \rightarrow x=\pm 2 \rightarrow h(2)=f(2)=1 \\ x =3 \rightarrow x=\pm 3 \rightarrow h(3)=f(3)=1 \end{cases}$	$\left\{ (1,1), (0,4), \left(\frac{1}{3},2\right), \left(-\frac{1}{3},2\right), \left(\frac{2}{3},-1\right) \right\}$ $\left\{ (2,1), (-2,1), (0,2), (-3,-1), (3,-1) \right\}$	۱۰