

$$a+1=b \rightarrow \frac{1}{\sqrt{x}} = \frac{1}{\sqrt{x}} x^{-1/2}$$

$$1 - \frac{1}{\sqrt{x}} \quad b = \frac{1}{\sqrt{x}}$$

$$a = 1/2$$

$$a+b = 2 \leftarrow \text{مطلوبه}$$

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(۱۰۵)

$$g(x) = \frac{|x-2| + \sqrt{x}}{\sqrt{x^2}} \xrightarrow{\text{ساده}} \frac{1(\sqrt{x^2}) - \frac{2x}{\sqrt{x}} (1-x-2)}{\sqrt{x^2}} + \frac{\frac{x}{\sqrt{x^2}} (\sqrt{x^2}) - \frac{4x}{\sqrt{x^2}} (1-x-2)}{\sqrt{x^2}}$$

$$g'(1) = \frac{1 - \frac{2}{1}}{1} + \frac{\frac{1}{1} - \frac{4}{1}}{1} = \frac{1}{1} - \frac{2}{1} = \frac{1-2}{1} = -\frac{1}{1}$$

$$f'(x) = 2\left(\frac{1}{\sqrt{x^2}}\right) - 2\left(\frac{1}{\sqrt{x^2}}\right) = 2 \times \frac{1}{2} = 1$$

(جواب کامل پایین صفحه)

$$\frac{1}{2} - \frac{1}{2} = \frac{1}{2} \leftarrow \text{مطلوبه}$$

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$$b = -x^{-2} \quad b = -\frac{1}{x^2}$$

$$a+c = \frac{1}{a}$$

$$c = \frac{1}{a}$$

$$ac = 1$$

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با توجه به مشتق اول و دوم، داریم: $b = b + (x-1)^m \rightarrow b \sim m > 0$

$f'(x) = 0$

$f'(x) = m(x-1)^{m-1}$

$m=2$

$m=3$

$0 \times 2 = 0$

$0 \times 3 = 0$

$0 \times 2 = 0$

$0 \times 3 = 0$

$m=1$

(۲)

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$$g(x) = \frac{1}{x^2 - (-x^2)} = \frac{1}{4x^2} = \frac{1}{4} \left(\frac{1}{x^2} \right)$$

$$f(x) = \frac{1}{\sqrt{x}} \rightarrow f'(x) = \frac{1}{2} \left(\frac{1}{x^{3/2}} \right) = -\frac{1}{2} x^{-3/2}$$

$$g'(x) = \frac{1}{4x^2} \rightarrow -\frac{1}{2} x^{-3/2} = -\frac{1}{2} \frac{1}{x^{3/2}}$$

$$g'(x) \times f'(x) = \left(\frac{1}{4x^2} \right) \times \left(-\frac{1}{2x^{3/2}} \right) = -\frac{1}{8x^{7/2}}$$

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$$-a - (r\alpha - \omega) = r$$

$$r\alpha + \omega = r$$

$$\alpha = \frac{-r\omega}{r}$$

$$y = \frac{r}{r}x - \omega \xrightarrow{x=r} \frac{r}{r} - \omega = \frac{-1}{r} \quad \frac{f(r)}{f'(r)} = \frac{-1/r}{r/r} = \frac{-1}{r} \quad \text{جواب} \quad (r)$$

$$(f \circ g)' = f'(g(x)) \cdot g'(x)$$

$$f'(g(x)) = \frac{1}{\sqrt{\frac{r}{x} - 1}} \quad (r) \quad (1)$$

$$\frac{-1 \cdot \sqrt{r}}{1 \cdot \sqrt{r}} = \frac{-1}{1} = -1$$

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

$$\frac{1}{\sqrt{\frac{r}{x} - 1}} = \frac{1}{\sqrt{\frac{r}{x} - 1}}$$

$$\frac{1}{\sqrt{\frac{r}{x} - 1}} = \frac{1}{\sqrt{\frac{r}{x} - 1}}$$

$$f(x) = (ax^2 + bx + c)^2 + 1 \rightarrow (r^2x^2 + \frac{r}{x}) \cdot x(x^2 + \frac{r}{x})$$

$$r^2x^2 + \frac{r}{x} \cdot x(x^2 + \frac{r}{x}) = r^2x^2 + r(x^2 + \frac{r}{x}) = r^2x^2 + rx^2 + \frac{r^2}{x}$$

جواب (نصف)

$$r^2x^2 + rx^2 + \frac{r^2}{x} = (r^2 + r)x^2 + \frac{r^2}{x}$$

$$g'(x) = f'(x+1) + r \cdot f'(x+1) \rightarrow r \cdot g'(x+1) = f'(-1 + r \cdot f'(x)) = \frac{r}{r} \cdot x = x \quad (r)$$

$$(r)$$

1

$$\frac{f'(x) - f'(a)}{x - a} = \frac{f'(x) - f'(a)}{x - a}$$

$$f'(x) = \frac{1}{\sqrt{x+1}} = \frac{1}{\sqrt{x+1}}$$

$$\frac{\frac{1}{\sqrt{x+1}} - \frac{1}{\sqrt{a+1}}}{x - a} = \frac{1}{\sqrt{x+1}} - \frac{1}{\sqrt{a+1}}$$

جواب (نصف)

$$\frac{1}{\sqrt{x+1}} - \frac{1}{\sqrt{a+1}} = \frac{1}{\sqrt{x+1}} - \frac{1}{\sqrt{a+1}}$$

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$$y = ax^2 - 2x + a$$

$$y = x^2 + 1 \quad y = \frac{1}{x} + \frac{1}{x}$$

$$(1, 1)$$

$$\rightarrow 1$$

$$y = x^2 - 2x + 1$$

$$y = x^2 - 2x + 1 \rightarrow x = 1 \rightarrow y = 1$$

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سوال ۱۲

$$f(x) = \frac{|x-1|}{\sqrt[3]{x^2}} \xrightarrow{x=1} \frac{-x+1}{\sqrt[3]{x^2}}$$

$$f'(x) = \left(\frac{-x+1}{\sqrt[3]{x^2}} \right)' = \frac{-1(1) - \frac{1}{3}\sqrt[3]{x} (2)}{\sqrt[3]{x^4}} \rightarrow f'(1) = \frac{-1(1) - \frac{1}{3}(2)}{1} = -\frac{5}{3}$$

$$g(x) = \frac{\sqrt{x^2 - x + 1} + \sqrt{x}}{\sqrt[3]{x^2}} = \frac{|x-1| + \sqrt{x}}{\sqrt[3]{x^2}} \xrightarrow{x=1} \frac{(-x+1) + \sqrt{x}}{\sqrt[3]{x^2}}$$

$$g'(x) = \frac{\left(-1 + \frac{1}{2\sqrt{x}}\right)(1) - \frac{1}{3}\sqrt[3]{x} (1 + \sqrt{x})}{\sqrt[3]{x^4}} \rightarrow g'(1) = \frac{\left(-1 + \frac{1}{2\sqrt{1}}\right) - \frac{1}{3}(1 + \sqrt{1})}{1} = -1 + \frac{1}{2} - \frac{1}{3} - \frac{1\sqrt{1}}{3} = -\frac{8}{6} - \frac{\sqrt{1}}{3}$$

$$f'(1) - 2g'(1) = -\frac{5}{3} - 2\left(-\frac{8}{6} - \frac{\sqrt{1}}{3}\right) = \frac{\sqrt{1}}{3}$$

$$g(x) = \frac{1}{\sqrt[3]{2x-1}} = (2x-1)^{-\frac{1}{3}} \rightarrow g'(x) = -\frac{1}{3}(2x-1)^{-\frac{4}{3}} \times 2 = -\frac{2}{3}(2x-1)^{-\frac{4}{3}}$$

سوال ۱۷

$$g'\left(\frac{1}{\sqrt{2}}\right) = -\frac{2}{3} \times \frac{1}{\sqrt{2}} \left(\frac{1}{\sqrt{2}}\right)^{-\frac{4}{3}} = -\frac{2}{3\sqrt{2}} \times \sqrt{2} = -\frac{2 \times \sqrt{2}}{3\sqrt{2}} = -\frac{2}{3} \rightarrow \underline{g'\left(\frac{1}{\sqrt{2}}\right) = -\frac{2}{3}}$$

$$f(x) = 19x^2 + 1 \rightarrow f'(x) = 38x \rightarrow \underline{f'(1) = 38}$$

$$y' = g'\left(\frac{1}{\sqrt{2}}\right) f'(1) = -\frac{2}{3} \times 38 = 38 \times \left(-\frac{2}{3}\right) \rightarrow \underline{\text{برابر ۰}}$$

$$f(x) = (x-1)\sqrt{x+1} \rightarrow f'(x) = \sqrt{x+1} + (x-1) \frac{1}{2\sqrt{x+1}} \rightarrow f'(\infty) = 1 + \frac{1}{2} = \frac{3}{2}$$

سوال ۹

$$f(\infty) = 1$$

$$\lim_{h \rightarrow 0} \frac{f'(\infty-h) - 2f'(\infty-h) + 1}{h(\infty-h)} = \lim_{h \rightarrow 0} \frac{-2f'(\infty-h)f'(\infty-h) + 1f'(\infty-h)}{\infty - 2h} =$$

$$\frac{-2f'(\infty)f'(\infty) + 1f'(\infty)}{\infty} = \frac{-2 \times \frac{3}{2} \times 2 + 1 \times \frac{3}{2}}{\infty} = \underline{\underline{\frac{-5}{2}}}$$