

۱۹،۲۵ آذرین

نام و نام خانوادگی علی محمدی پاسخنانه تشریحی تکلیف شماره کلاس

$$x^T a x + b \xrightarrow{x \rightarrow 1} (x-1)^T = m^T - \varepsilon m + \varepsilon$$

$$a = -\varepsilon \quad b = \varepsilon \quad a \neq b \quad \checkmark$$

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$$x^T a x + b \xrightarrow{x \rightarrow \sqrt{\varepsilon}} (x - \sqrt{\varepsilon})^T = m^T - \sqrt{\varepsilon} m + \sqrt{\varepsilon}$$

$$b = \sqrt{\varepsilon} \quad a = -\sqrt{\varepsilon} \quad \begin{bmatrix} b \\ a \end{bmatrix} = \begin{bmatrix} \sqrt{\varepsilon} \\ -\sqrt{\varepsilon} \end{bmatrix} = -1 \quad \checkmark$$

۲

$$\left(\frac{\sqrt{a}}{x} + \frac{1}{x} + a \right) + a \rightarrow a = \frac{1}{x} \quad \begin{bmatrix} a \\ b \end{bmatrix} = -1 \quad \checkmark$$

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$$\frac{1/x - 1/x + \begin{bmatrix} -1 \\ -1/x \end{bmatrix}}{x \varepsilon x - 1/x + \begin{bmatrix} 1 \\ -1/x \end{bmatrix}} = \frac{-1/x + 1}{-1/x + 1/x} = \frac{1}{0^+} = +\infty \quad \checkmark$$

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$$\frac{x^T - \varepsilon}{x^T - 1} \xrightarrow{x \rightarrow 1} \frac{x^T}{x^T} = \frac{1}{1} \quad \checkmark$$

۵

$$\frac{x^T + (1-x+1)^2}{(1+x)^2} \xrightarrow{x \rightarrow -1} \frac{1}{4} \xrightarrow{L'Hop} \frac{1}{4} = \frac{-1}{1} = -1$$

✓

6

$$\frac{\sqrt{1+x} - \sqrt{1-x}}{\sqrt{1-(1-\frac{x^2}{4})}} \times \frac{\sqrt{1+x} + \sqrt{1-x}}{\sqrt{1+x} + \sqrt{1-x}} = \frac{2x \sqrt{1-x}}{2 \sqrt{1-x}} = -1$$

✓

7

$$\frac{k + \cos(0)}{0} \rightarrow \frac{0}{0} \quad k+1=0 \rightarrow k=-1$$

$$\frac{-1 + \cos(\sqrt{a}x)}{-ax^2} = \frac{-1 + 1 - \frac{a^2 x^2}{2}}{-ax^2} = \frac{a}{2} = 1 \rightarrow a=2$$

$$\frac{a}{k} = \frac{2}{-1} = -2$$

✓

8

$$\frac{x \sqrt{x-a} + x(\sqrt{x} - \sqrt{a})}{\sqrt{x^2 - a^2}} = \frac{x}{\sqrt{x+a}} + \frac{x(\sqrt{x} - \sqrt{a})}{\sqrt{x^2 - a^2}}$$

1.25

9

$$\lim_{n \rightarrow \infty} \frac{1-k^n}{n^2-1} = -\infty \rightarrow \frac{1+k}{0} = -\infty \quad |k| > 1$$

مطلوب

✓

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$$\lim_{n \rightarrow r_a^+} \frac{r\sqrt{n-r_a}}{\sqrt{n-r_a}\sqrt{n+r_a}} + \frac{r(\sqrt{n}-\sqrt{r_a})}{\sqrt{n-r_a}\sqrt{n+r_a}} = \lim_{n \rightarrow r_a^+} \frac{r}{\sqrt{4a}} + \frac{r(\sqrt{n}-\sqrt{r_a})}{\sqrt{n-r_a}\sqrt{n+r_a}} \times \frac{\sqrt{n}+\sqrt{r_a}}{\sqrt{n}+\sqrt{r_a}}$$

$$\lim_{n \rightarrow r_a^+} \frac{r}{\sqrt{4a}} + \frac{r(\sqrt{n-r_a})}{\sqrt{n-r_a}\sqrt{n+r_a}(\sqrt{n}+\sqrt{r_a})} = \lim_{n \rightarrow r_a^+} \left(\frac{r}{\sqrt{4a}} + \frac{r\sqrt{n-r_a}}{\sqrt{n-r_a}(\sqrt{n}+\sqrt{r_a})} \right) = \lim_{n \rightarrow r_a^+} \frac{r}{\sqrt{4a}} + \cdot \rightsquigarrow \frac{r}{\sqrt{4a}} = \sqrt{\frac{r}{4a}} = \sqrt{\frac{r}{r_a}}$$