ماهان میرمتقی‌الهی ←

۱ ←

چپ ← $\lim_{x\to 2^-} 4x-3 = \boxed{5}$

راست ← $\lim_{x\to 2^+} 4x-3 = \boxed{5}$

۲ ←

چپ ← $\lim_{x\to 2^-} 4[x]-3 = \boxed{1}$

راست ← $\lim_{x\to 2^+} 4[x]-3 = \boxed{5}$

۳ ←

چپ ← $\lim_{x\to 2^-} [4x-3] = \boxed{4}$

راست ← $\lim_{x\to 2^+} [4x-3] = \boxed{5}$

۴ ←

چپ ← $\left[\lim_{x\to 2^-} 4x-3\right] = \boxed{5}$

راست ← $\left[\lim_{x\to 2^+} 4x-3\right] = \boxed{5}$

۵ ←

راست ←

$$\lim_{x\to 3} \frac{4x-3}{x-3} \begin{cases} \xrightarrow{3^+} \dfrac{4\times 3-3}{3^+-3} = \dfrac{9}{0^+} = \boxed{+\infty} \\ \xrightarrow{3^-} \dfrac{4\times 3-3}{3^--3} = \dfrac{9}{0^-} = \boxed{-\infty} \end{cases}$$

پوچ

$$\lim_{x\to ۳} \frac{۴x-۳}{(x-۳)^۲} \begin{cases} \xrightarrow{۳^+} \dfrac{۹}{(۰^+)^۲} = \boxed{\infty^+} \\ \xrightarrow{۳^-} \dfrac{۹}{\underbrace{(۰^-)^۲}_{۰^+}} = \boxed{\infty^+} \end{cases}$$

اقلج

$$\lim_{x\to ۳} \frac{۴x-۳}{\sqrt{x-۳}} \begin{cases} \xrightarrow{۳^+} \dfrac{۹}{\sqrt{۰^+}} = \boxed{\infty^+} \\ \xrightarrow{۳^-} \dfrac{۹}{\sqrt{۰^-}} = \boxed{\varnothing} \end{cases}$$

۶ج پوچ

$$\lim_{x\to ۳} \frac{۴x-۳}{\sqrt{(x-۳)(x+۱)}} \begin{cases} \xrightarrow{۳^+} \dfrac{۹}{\sqrt{۰^+ \times ۴}} = \boxed{\infty^+} \\ \xrightarrow{۳^-} \dfrac{۹}{\sqrt{۰^- \times ۴}} = \boxed{\varnothing} \end{cases}$$

اقلج

$$\lim_{x\to ۳} \frac{۴x-۳}{\underbrace{x^۲-۷x+۱۲}_{(x-۳)(x-۴)}} \begin{cases} \xrightarrow{۳^+} \dfrac{۹}{۰^+ \times -۱} = \boxed{\infty^-} \\ \xrightarrow{۳^-} \dfrac{۹}{۰^- \times -۱} = \boxed{\infty^+} \end{cases}$$

۷ج پوچ

$$\lim_{x\to ۳} \frac{۴x-۳}{[x-۳]} \begin{cases} \xrightarrow{۳^+} \dfrac{۹}{\underbrace{[۰^+]}_{۰}} = \boxed{\varnothing} \\ \xrightarrow{۳^-} \dfrac{۹}{\underbrace{[۰^-]}_{-۱}} = -۹ \end{cases}$$

اقلج

$$\lim_{x\to ۳} [۳x] + [-۲x] \begin{cases} \xrightarrow{۳^+} \underbrace{[۳\times ۳,۱]}_{۹} + \underbrace{[-۲\times ۳,۱]}_{-۷} = \boxed{۲} \\ \xrightarrow{۳^-} \underbrace{[۳\times ۲,۹]}_{۸} + \underbrace{[-۲\times ۲,۹]}_{-۶} = ۲ \end{cases}$$

$۹,۳$; $-۶,۲$; $۸,۷$; $-۵,۸$

۸ج پوچ

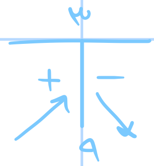
$-۵,۹\times -۴$

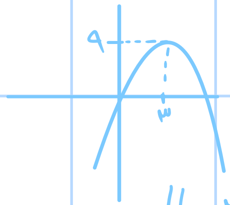
$$\lim_{x\to -۶} [-۴\times x] + [۲\times x] \begin{cases} \xrightarrow{-۶^+} [-۴\times -۵,۹] + [۲\times -۵,۹] = ۲۳-۱۲ = \boxed{۱۱} \\ \xrightarrow{-۶^-} [-۴\times -۶,۱] + [۲\times -۶,۱] = ۲۴-۱۳ = \boxed{۱۱} \end{cases}$$

۹ج جواب

$$\lim_{x\to 3}[6x-x^2]$$

مشتق $\to 6-2x \to$





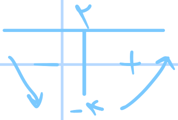
$\xrightarrow{3^+} \boxed{8}$

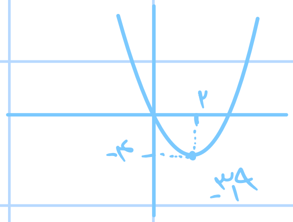
$\xrightarrow{3^-} \boxed{8}$

الف

$$\lim_{x\to 2}[x^2-4x]$$

مشتق بگیر $\to 2x-4 \to$





$\xrightarrow{2^+} \boxed{-4}$

$\xrightarrow{2^-} \boxed{-4}$

۱۵ج جواب

$$\lim_{x\to 1}\frac{x-[x]}{x^2-1}$$

$1^+ \to \frac{0}{0} \xrightarrow[{[x]=1}]{\text{رفع}} \frac{\cancel{x-1}}{\cancel{(x-1)}(x+1)} = \frac{1}{x+1} = \boxed{\frac{1}{2}}$

$1^- \to \frac{x}{\underbrace{(x-1)}_{0^-}\underbrace{(x+1)}_{2^-}} = \frac{1}{-\infty \times 2} = \boxed{-\infty}$

الف

$$\lim_{x\to 2}\frac{|x-2|}{\underbrace{x^2-3x+2}_{(x-2)(x-1)}} = \frac{0}{0} \xrightarrow{\text{رفع ابهام}}$$

$2^+ \to \frac{\cancel{x-2}}{\cancel{(x-2)}(x-1)} = \frac{1}{x-1} = \boxed{1}$

$2^- \to \frac{\cancel{-x+2}\,-1}{\cancel{(x-2)}(x-1)} = \frac{-1}{x-1} = \boxed{-1}$