



سایت ویژه ریاضیات www.riazisara.ir

درسنامه ها و جزوه های دروس ریاضیات

دانلود نمونه سوالات امتحانات ریاضی

نمونه سوالات و پاسخنامه کنکور

دانلود نرم افزارهای ریاضیات

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کانال سایت ریاضی سرا در تلگرام:

<https://telegram.me/riazisara>

(@riazisara)

Subject:

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$$1.1) \quad x f(x) > 0 \Rightarrow \begin{cases} x > 0, f(x) > 0 \Rightarrow x > 0, x \leq 2 \Rightarrow -1 < x \leq 2 \cup \\ x < 0, f(x) < 0 \Rightarrow x < 0, 2 < x \leq 2 \Rightarrow \emptyset \end{cases} \Rightarrow$$

$$y = e^{-x} \Rightarrow e^x = 2 - y \Rightarrow x = \ln(2 - y) = f^{-1}(y) = \ln(2 - y)$$

$[0, 2] \Rightarrow$ ترتیب 1

$$1.2) \quad \begin{cases} a > 0 \Rightarrow a \leq 2 & b < a < 2 \\ -\frac{b}{a} > 0 \Rightarrow a > 2 \\ \frac{c}{a} > 0 \Rightarrow a < 1 \end{cases} \Rightarrow 0 < a < 1 < 2 \Rightarrow$$
 ترتیب 2

$$1.3) \quad (2, 2) \rightarrow a + \log_2 \frac{2b-2}{2} = 4 \Rightarrow \log_2 \frac{2b-2}{2} = 2 \Rightarrow \frac{2b-2}{2} = 4 \Rightarrow b=5, a=2$$

$$(12, 1) \rightarrow a + \log_2 \frac{12b-1}{2} = 1$$

\Rightarrow ترتیب 3

$$1.4) \quad T = 4\pi \rightarrow \frac{r\pi}{|m|} = 4\pi \Rightarrow |m| = \frac{1}{4} \Rightarrow m = \pm \frac{1}{4}$$

$$y = \frac{1}{4} + 2 \cos \frac{1}{4} x \Rightarrow y\left(\frac{12\pi}{4}\right) = \frac{1}{4} + 2 \cos \frac{12\pi}{4} = \frac{1}{4} + 2\left(-\frac{1}{2}\right) = -\frac{1}{4}$$

ترتیب 4

$$1.5) \quad r^x + \frac{\Lambda}{r} = \left(\frac{\sqrt{r}}{r}\right)^{2x} \Rightarrow r^x + \frac{\Lambda}{r} = r^{-x} \Rightarrow y + \frac{\Lambda}{r} = \frac{1}{y} \Rightarrow$$

$$y^2 + \Lambda y - r = 0 \Rightarrow y = \frac{1}{r} \sqrt{\dots}$$

قاطع $(-1, 3)$
 $(-1, 1)$

ترتیب 5 $d=2$

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$$1.4) \sqrt{\alpha} + \sqrt{\beta} = r \Rightarrow \alpha + \beta + 2\sqrt{\alpha\beta} = r^2 \Rightarrow \frac{m+1}{r} + 2\sqrt{\frac{1}{r^2}} = r^2 \Rightarrow$$

$$\frac{m+1}{r} + \frac{1}{r} = r^2 \Rightarrow \frac{m+r}{r} = r^2 \Rightarrow m = r^3 - r \Rightarrow \text{گزیده}$$

$$1.5) D_{g \circ f} = \{x \in D_f \mid f(x) \in D_g\} = \{x \neq \pm 1 \mid \frac{1+x^2}{1-x^2} \in [0, 1]\} = \{0\}$$

$x=0$
گزیده

$$1.8) \sin\left(\frac{\pi}{3} + \pi - \frac{\pi}{4}\right) = -\frac{1}{4} = \text{گزیده}$$

$$1.9) \text{گزیده}$$

$$\frac{\cos 2\alpha - \sin \alpha}{\sin \alpha \cos \alpha} = \frac{\frac{\sqrt{2}}{2}}{\frac{1}{2} \times \frac{1}{2}} = 2\sqrt{2}$$

$$11.1) \sin \alpha \sin^2 x = \cos^2 x \Rightarrow \frac{1}{r} [\cos^2 x - \cos^2 x] = \cos^2 x \Rightarrow$$

$$-\cos^2 x = \cos^2 x \Rightarrow \cos(\pi - 2x) = \cos^2 x \Rightarrow \begin{cases} \pi - 2x = 2k\pi + \alpha \\ \pi - 2x = 2k\pi - \alpha \end{cases}$$

$$\Rightarrow \begin{cases} \alpha = \frac{k\pi}{2} + \frac{\pi}{4} \\ \alpha = k\pi - \frac{\pi}{4} \end{cases} \xrightarrow{0} \frac{k\pi}{2} + \frac{\pi}{4} \Rightarrow \text{گزیده}$$

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$$114) \begin{aligned} f(0) &= 1 & f\left(\frac{1}{e}\right) &= -\frac{e}{\lambda} \\ f\left(\frac{1}{e}\right) &= \frac{1}{\sqrt{e}} & f\left(\frac{1}{\sqrt{e}}\right) &= \frac{-1\sqrt{e}}{\sqrt{e}} \end{aligned} \Rightarrow \text{گزینه ۵}$$

$$115) y = |\ln x| \Rightarrow \ln x = 0 \Rightarrow x = 1 \quad \text{نقطه}$$

$$x > 1 \Rightarrow y = \ln x \rightarrow y' = \frac{1}{x} \Rightarrow f'_+(1) = 1 = m_1$$

$$x < 1 \Rightarrow y = -\ln x \rightarrow y' = -\frac{1}{x} \Rightarrow f'_-(1) = -1 = m_2$$

$$m_1 m_2 = -1 \stackrel{\theta=90^\circ}{=} \text{تangent} = 90^\circ \Rightarrow \text{گزینه ۴}$$

$$118) \text{H.P.} \lim_{x \rightarrow \infty} \frac{f(x)}{1} = -\frac{e}{f} = f'(x) = -\frac{e}{f} \quad \left| \frac{f(x)+v}{f-x} = \frac{0}{0} \Rightarrow f'(x) = -v \right.$$

$$y = \frac{f(x)}{x} \Rightarrow y' = \frac{x f'(x) - f(x)}{x^2} \stackrel{x=2}{=} \frac{2\left(-\frac{e}{f}\right)(2) + v}{4} = \frac{1}{2}$$

\Rightarrow گزینه ۳

$$119) y = n \cdot f \text{ تابع } \iff y = n \cdot f \text{ تابع } = 1$$

$$\begin{cases} f(x) = n + \ln x \\ y = n \end{cases} \Rightarrow n + \ln x = n \Rightarrow \ln x = 0 \Rightarrow x = 1$$

$$\Rightarrow (1, 1) \quad f'(x) = \frac{1}{x}$$

$$m = (f')'(1) = \frac{1}{f'(1)} = \frac{1}{1} \Rightarrow m' = -2$$

$$y - 1 = -2(x - 1) \Rightarrow y + 2x = 3$$

گزینه ۵

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1.1) $x f(x) > 0 \Rightarrow \begin{cases} x > 0, f(x) > 0 \Rightarrow x > 0, x \leq 2 \Rightarrow -1 \leq x \leq 2 \cup \\ x < 0, f(x) < 0 \Rightarrow x < 0, x \leq 2 \Rightarrow \emptyset \end{cases} \Rightarrow$

$y = e^{-x} \Rightarrow e^x = 2 - y \Rightarrow x = \ln(2 - y) = f^{-1}(y) = \ln(2 - y)$

$[0, 2] \Rightarrow$ 1 ترتیب

1.2) $\begin{cases} a > 0 \Rightarrow a \leq 2 & b > a > 0 \\ -\frac{b}{a} > 0 \Rightarrow a > 2 \\ \frac{c}{a} > 0 \Rightarrow a < 2 \end{cases} \Rightarrow 0 < a < 2 \Rightarrow$ 2 ترتیب

1.3) $(2, 2) \rightarrow a + \log_p \frac{2b-2}{2} = 4 \Rightarrow \log_p \frac{2b-2}{2} = 2 \Rightarrow b=2, a=0$
 $(1, 1) \rightarrow a + \log_p \frac{2b-1}{2} = 1$

\Rightarrow 3 ترتیب

1.4) $T = 4\pi \rightarrow \frac{4\pi}{|m|} = 4\pi \Rightarrow |m| = 1 \Rightarrow m = \pm 1$

$y = \frac{1}{2} + 2 \cos \frac{1}{2} x \Rightarrow y(\frac{12\pi}{2}) = \frac{1}{2} + 2 \cos \frac{12\pi}{2} = \frac{1}{2} + 2(-1) = -\frac{3}{2}$

1.5) $x^2 + \frac{\Lambda}{x} = (\frac{\sqrt{x}}{x})^{2x} \Rightarrow x^2 + \frac{\Lambda}{x} = x^{-x} \Rightarrow y + \frac{\Lambda}{x} = \frac{1}{y} \Rightarrow$
 $x^2 + \Lambda y - 2 = 0 \Rightarrow x = \frac{1}{y} \Rightarrow x^2 = \frac{1}{y^2} \Rightarrow m = -1 \Rightarrow (-1, 3), (-1, 1)$

3 ترتیب $d=2$

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III) $1 - \cos u \sim \frac{ku^2}{2}$ if $u \rightarrow 0$.

$$= \lim_{x \rightarrow 0} \frac{1 - \frac{1}{r} \cdot \frac{9x^r}{r} - (1 - \frac{1}{r} \cdot \frac{x^r}{r})}{x^r} = -2 \Rightarrow \text{درستی}$$

II) $f(x) = \frac{1}{1 + \frac{x}{r}} \cos\left(\frac{\pi}{r} + \frac{1}{r} \frac{x}{r}\right) \Rightarrow f(r\sqrt{r}) = -\frac{1}{1+r} \Rightarrow \text{درستی}$

III) $a_n: -1, 0, -1, 0, \dots$

II) $f(x) = \begin{cases} -1 & : x \in \mathbb{Z} \\ a & : x \notin \mathbb{Z} \end{cases}$

$b \notin \mathbb{Z} \Rightarrow f(b) = \lim_{n \rightarrow b} f(n) = -1 \Rightarrow$ درستی

$b \in \mathbb{Z}: f(b) = \lim_{n \rightarrow b} f(n) = -1 \Rightarrow a = -1 \Rightarrow \text{درستی}$

II) $y = \sqrt{\frac{r(x - \frac{r}{r})}{x-1}} = r \sqrt{\frac{x - \frac{r}{r}}{x-1}} \sim r(x + \frac{-\frac{r}{r} + 1}{r})$

$= rx + \frac{1}{r} \xrightarrow{x \rightarrow 0} y = \frac{1}{r} \Rightarrow \text{درستی}$

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$$120) m = F = \frac{-f'_x}{f'_y} = -\frac{2x^2 - 2y}{2y^2 - 2x} \quad \frac{x=1}{y=2} = \frac{1}{3} \Rightarrow m' = -3$$

$$\Rightarrow y - 2 = -3(x - 1) \xrightarrow{m=1} y = 0 \Rightarrow \text{خط مماس}$$

$$121) r = \sqrt{x^2 + y^2} \Rightarrow v(t) = \sqrt{x^2 + y^2} v'(t) = r v'(t) = r$$

$$s = r v' \Rightarrow s(t) = r v'(t) = \frac{r (r v'(t))}{r} = \frac{r \times r}{r} = r \Rightarrow \text{خط مماس}$$

$$122) \begin{cases} f'(x) = 2(-\sin x)(\cos x) + 2 \sin x = 2 \sin x - 2 \sin x \\ f'(x) = 2 \cos x - 2 \cos x \end{cases} \quad f' < 0, f'' <$$

$$x = 110^\circ \Rightarrow f' > 0 \Rightarrow \text{خط مماس}$$

$$x = 180^\circ \Rightarrow f' = 0 \Rightarrow \text{خط مماس}$$

$$123) s = \int_0^{\pi} \sqrt{1 - \cos^2 x} = \int_0^{\pi} \sqrt{\sin^2 x} = \sqrt{2} \int_0^{\pi} \sin x dx$$

$$= -\sqrt{2} \cos x \Big|_0^{\pi} = (\sqrt{2} - (-\sqrt{2})) = 2\sqrt{2} \Rightarrow \text{خط مماس}$$

$$124) = \int_0^1 (1 - \sqrt{x}) dx + \int_1^4 (\sqrt{x} - 1) dx =$$

$$\left(x - \frac{2}{3} x \sqrt{x} \right) \Big|_0^1 + \left(\frac{2}{3} x \sqrt{x} - x \right) \Big|_1^4 = \frac{1}{3} + \frac{1}{3} = \frac{2}{3} \Rightarrow \text{خط مماس}$$