

$$a, ar, ar^2, \dots$$

① ثلاثية

$$a/2, a/2 r, a/2 r^2$$

$$a/2 r - a/2 = a/2 (r-1) = d$$

$$a/2 r (r-1) = d \implies \frac{a/2 (r-1)}{a/2 r (r+1)} = \frac{d}{d} = 1$$

$$\frac{1}{r} = 1 \implies r = 1 \quad \text{بما أن } d = 0 \implies d = 0$$

$$r + d = 1 \checkmark$$

② ثلاثية

$$B(-5, y) \text{ فرض}$$

$$A(3, y) \implies x_5 = \frac{-5+3}{2} = -1$$

$$S_5 = \begin{bmatrix} -1 \\ +1 \end{bmatrix}$$

$$\alpha^2 + \beta^2 = 5 = S^2 - 2p$$

$$y = a(x+1)^2 + 1 = ax^2 + 2ax + a + 1$$

$$S = \frac{-2a}{a} = -2 \implies p = \frac{a+1}{a}$$

$$(-2)^2 - 2\left(\frac{a+1}{a}\right) = 5 \implies 4 - \frac{2a+2}{a} = 5$$

$$\frac{2a+2}{a} = -1 \implies 2a+2 = -a \implies 3a = -2$$

$$a = -\frac{2}{3} \implies y = -\frac{2}{3}(x+1)^2 + 1$$

Date

No

$$y = -\frac{2}{3}x + 1 = \frac{1}{3}$$

⑤ تزییری (۱۴)

$$S = + \quad p = \frac{-b}{a} = \frac{-b}{-20b} = \frac{1}{20}$$

$$a(n^2 - n) = b$$

$$n^2 - n = b/a$$

$$a(n^2 - n + \frac{1}{20}) = 0 \Rightarrow \sqrt{1 - \frac{1}{3}} = \frac{2}{\sqrt{5}}$$

$$\frac{20(\alpha^2 + \beta)}{5^2 - 2p} + 20\beta^2 - 20\beta = 17$$

$$20(\beta^2 - \beta) = 17$$

$$20\left(1 + \frac{2b}{a}\right) + \frac{20b}{a} = 17$$

$$20 + \frac{60b}{a} = 17$$

$$\frac{60b}{a} = -3 \Rightarrow a = -20b$$

$$\frac{1}{x^2} + \frac{1}{(1-x)^2} = \frac{160}{9} \quad (4)$$

$$\frac{(1-x)^2 + x^2}{x^2(1-x)^2} = \frac{160}{9} \Rightarrow \frac{2x^2 - 2x + 1}{(x-x^2)^2} = \frac{160}{9}$$

$$x^2 - x = t \Rightarrow \frac{2t+1}{(-t)^2} = \frac{160}{9}$$

$$160t^2 = (2t+1)^2 \Rightarrow 160t^2 - 18t - 1 = 0$$

$$t = \frac{18 \pm \sqrt{6084}}{320} = \frac{18 \pm 78}{320}$$

$$x^2 - x = \frac{3}{10} \Rightarrow 10x^2 - 10x - 3 = 0$$

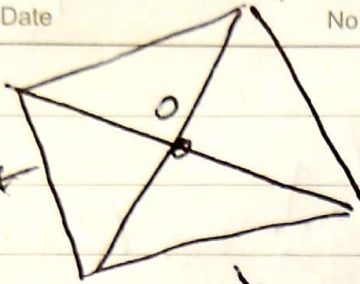
$$\Delta > 0 \Rightarrow S = 1$$

$$x^2 - x = -\frac{3}{16} \Rightarrow 16x^2 - (15x + 3) = 0 \quad \Delta > 0 \quad S = 1$$

$$\text{جواب} = 1 + 1 = 2$$

Date

No

A |  $\begin{matrix} \varepsilon, 0 \\ \varepsilon, 0 \end{matrix}$ 

نمبر ۴ (۷)

$$4x + y = 3$$

B |  $\begin{matrix} 1 \\ -1 \end{matrix}$ 

$$x - 4y = 5 \Rightarrow$$

$$\begin{cases} x - 4y = 5 \\ 4x + y = 3 \end{cases}$$

$$x = 1 \quad y = -1$$

$$\frac{A+B}{0} = \frac{A+B}{2} = \left| \frac{4, 5}{2} \right| = \left| \frac{11}{4} \right|$$

$$x - 4y - 5 = 0 \Rightarrow d = \frac{|1(1) - 4(-1) - 5|}{\sqrt{1 + 16}} = \frac{|1 + 4 - 5|}{\sqrt{17}}$$

$$d = \frac{|11/4 - 7|}{\sqrt{17}} = \frac{|14/4 - 28/4|}{\sqrt{17}} = \frac{|-14/4|}{\sqrt{17}} = \frac{14/4}{\sqrt{17}} = \frac{7}{2\sqrt{17}} \rightarrow \text{Max}$$

$$4x + y - 3 = 0 \Rightarrow d = \frac{|4(11/4) + (-1) - 3|}{\sqrt{1 + 16}} = \frac{|11 - 1 - 3|}{\sqrt{17}} = \frac{|7|}{\sqrt{17}}$$

$$d = \frac{|11 - 2, 5|}{\sqrt{17}} = \frac{|7/2|}{\sqrt{17}} = \frac{\sqrt{17}}{2} \checkmark$$

4/8

$$f(m) = \sqrt{n - 2\sqrt{mn} - 1}$$

$$y = 12 - n \rightarrow f^{-1} \left( \begin{array}{l} 1 \\ 10 \end{array} \right) \Rightarrow 12 - n = 1$$

$$n = 11$$

$$x = 2 \rightarrow f(2) = 1 \Rightarrow f(1) = 2$$

$$2 = \sqrt{10 - 2\sqrt{10 \cdot m} - 1} \Rightarrow m = 1$$

$$f(m+4) = f(5) = \sqrt{5 - 2\sqrt{5} - 1} = 1$$

$$\log_5^3 = \frac{10}{14} = \frac{5}{7}$$

$$\log_5^2 = \frac{10}{24} = \frac{5}{12}$$

$$A_2 = A_1 \left(\frac{8}{9}\right)^t \Rightarrow \frac{1}{6} = \left(\frac{8}{9}\right)^t$$

$$\Rightarrow 6 = \left(\frac{9}{8}\right)^t$$

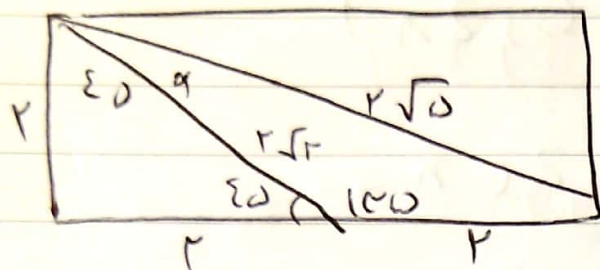
$$\log_5^6 = t(\log_5^9 - \log_5^8)$$

$$\frac{5}{12} + \frac{1}{7} = t \left( \frac{10^2}{7} - \frac{15^3}{12} \right) = \frac{19}{84} = t \times \frac{3}{84}$$

Date

No

$$t = \frac{19}{3} \times 60 = 380$$



نرسید ۱۰

$$\frac{2\sqrt{5}}{\sin 135} = \frac{2}{\sin \alpha} \Rightarrow \sin \alpha = \frac{2 \times \sin 135}{2\sqrt{5}}$$

$$\sin \alpha = \frac{2 \times \frac{\sqrt{2}}{2}}{2\sqrt{5}} = \frac{\sqrt{2}}{2\sqrt{5}}$$

$$1 + \cos^2 \alpha = \frac{1}{\sin^2 2\alpha} = \frac{1}{\frac{2}{4 \times 5}} = 10$$

$$\cot^2 \alpha = 9 \Rightarrow \cot \alpha = 3 \checkmark$$

$$f_{\text{am}} = \frac{9}{2} = \frac{1}{2} \times \sqrt{3} \times 6 \sin \alpha$$

نرسید ۱۱

$$\sin \alpha = \frac{\sqrt{3}}{2} \begin{cases} \theta = 120 \\ \theta = 60 \end{cases} = 2 \checkmark$$

(12)

$$f(x) = a + \frac{b}{2} \sin(2cx - 3\frac{\pi}{2})$$

$$f(x) = a + \frac{b}{2} (\cos 2x)$$

$$f(x) = 1 - 2 \cos 2x = 0$$

$$T = \pi = \frac{2\pi}{c} \Rightarrow c = 1$$

$$\cos 2x = \frac{1}{2} \Rightarrow 2x = \frac{\pi}{3}$$

$$2x = 2\pi - \frac{\pi}{3} \Rightarrow x = \frac{\pi}{6}, x = \frac{5\pi}{6}$$

$$\frac{2\pi}{3} \checkmark$$

$$\cos 2x = \frac{1}{2}$$

$$2x = \frac{\pi}{3}, 2x = 2\pi - \frac{\pi}{3} \Rightarrow x = \frac{\pi}{6}, \frac{5\pi}{6}$$

$$\rightarrow \rightarrow \frac{2\pi}{3}$$

(13) تیز تیز 3

$$\frac{\sqrt{2}}{2} \cos x - \frac{\sqrt{2}}{2} \sin x = \frac{1}{\sqrt{3}}$$

$$\cos x - \sin x = \sqrt{\frac{2}{3}} = z$$

$$\cos x - \sin x = z \Rightarrow z^2 = 1 - \sin 2x$$

$$m t^2 = 3\sqrt{6}(1 - t^2) = \sqrt{6}$$

$$3\sqrt{6}t^2 + mt - 4\sqrt{6} = 0$$

$$2\sqrt{6} + m\sqrt{\frac{2}{3}} - 4\sqrt{6} = 0$$

$$m\sqrt{\frac{2}{3}} = 2\sqrt{6} \Rightarrow \frac{m}{\sqrt{3}} = 2\sqrt{3}$$

$$m = 6 \checkmark$$



Date

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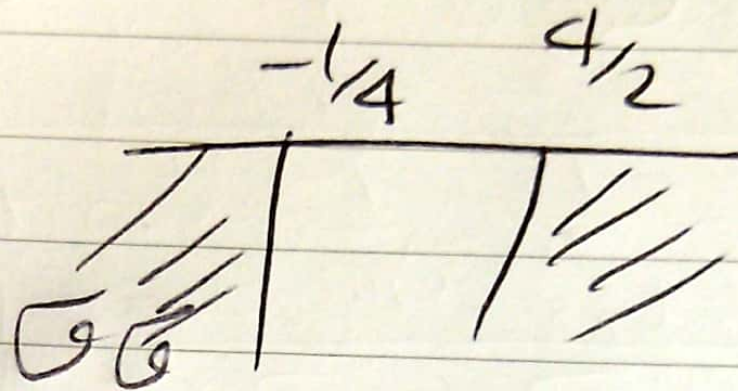
19) حوض آب سے پانی کے

$$m^2 - m - 5 < 3 + 2m - m^2$$

$$\rightarrow$$

$$2m^2 - 3m - 2 >$$

$$-\frac{1}{2} < m < \frac{4}{2}$$



Date

No

$$\frac{ax+b}{cx+d} \Rightarrow$$

(15)  
(3)  $\rightarrow$  (15)

$$\frac{a/c}{-b/a} = \frac{-b/a}{c/a} \Rightarrow a = +\frac{b^2}{a}$$

$$a^2 = b^2 \Rightarrow a = \pm b$$

$$f(x) = \frac{cx+b}{cx+d} = \frac{-dx+b}{cx-a} \Rightarrow g = \frac{cx+d}{ax+b}$$

$$g^{-1} = \frac{-bx+d}{ax-c}$$

$$\lim_{x \rightarrow t} f(x) = \frac{-b}{a} = \pm 1$$

$\rightarrow$  (10)

$$(2) \Rightarrow 5 = 1+k \Rightarrow k=4$$

$$-2 \Rightarrow 3 = 1+k \Rightarrow k=2$$

$$E/n \rightarrow \binom{n+}{n} |x^n - (-n-1)| = |n+1| = |n+1|$$

$$\binom{n-}{n} x^n - (+n-1) + k = k$$

$$\frac{k}{k+n}$$

$$1 : k = |1+1| = 2$$

$$-1 : k = |-1| = 1$$

$$(-n)^+ : (n^{-n} - (n-1)) | = |-(n+1)| = (n+1)$$

$$(-n)^- : n^{-n} - (-n-1) + k = k+1$$

$$g_m = \frac{f(m) - 1}{n}$$

(17)

$$\lim_{n \rightarrow \infty} g_m = f(x)$$

$$2 \left( \frac{2 \cos x}{(1 + \sin x)^2} \right) \left( \frac{-1 + \sin x}{1 + \sin x} \right)$$

$$2x^2 - 1 = -9 \checkmark$$

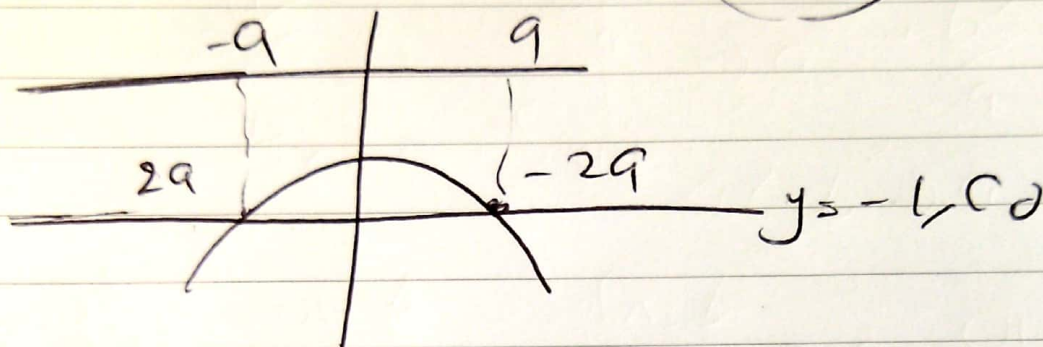
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No

$$y = -x^2 - 1 \Rightarrow y' = -2x$$

(18)

$$-4a^2 = -1 \Rightarrow a = \frac{1}{2}$$



(20)

$$y' = \frac{1}{2\sqrt{x}} = 2 \Rightarrow \sqrt{x} = \frac{1}{4}$$

$$x = \frac{1}{16}$$

$$d = \frac{\frac{1}{4} - \frac{1}{8} - 2}{\sqrt{5}} = \frac{\frac{1}{8} - 2}{\sqrt{5}} = \frac{\frac{15}{8}}{\sqrt{5}} = \frac{3\sqrt{5}}{8}$$



## مهندس محمد حمیدی

- ✓ مولف کتاب ریاضیات و سه سطحی کانون
- ✓ اولین طراح هر سه پایه و هر سه رشته نظری
- ✓ اولین ارائه دهنده سوالات احتمالی کنکور
- ✓ مولف کتاب الکترونیکی ۱۵٪ تست
- ✓ مولف، طراح و ویراستار ریاضی آزمون های آزمایشی ماز، گاج، گزینه دو و سنجش
- ✓ عضو انجمن ریاضی ایران
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- ✓ اولین ارائه دهنده پاسخ تشریحی کنکور در وب سایت های رسمی

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