

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ  
 باسلام حضرت دانش اگهزان عزیز در کلاس های آینده امیدوارم از حضور شما با هدف صیقلیت بیشتر بهره مند بشوم  
 بیسایکس (برعنوان اولین دبیر کلاس) با نیت ریاضیات تجربی (مطابق ۹۵) برای آزمون (بابت استیفات های قبلی)  
 آقایان عزیز خواهش می کنم  
 امیدوارم ایرانی - دبیر استیفات تجربی

@konkur\_irani

128 -  $\log_3(2x^2+1) - \log_3(x+2) = 1$

$\log_3\left(\frac{2x^2+1}{x+2}\right) = 1 \Rightarrow \frac{2x^2+1}{x+2} = 3$

$2x^2+1 = 3x+6 \Rightarrow 2x^2-3x-5=0$

$x = -1, \frac{5}{2}$

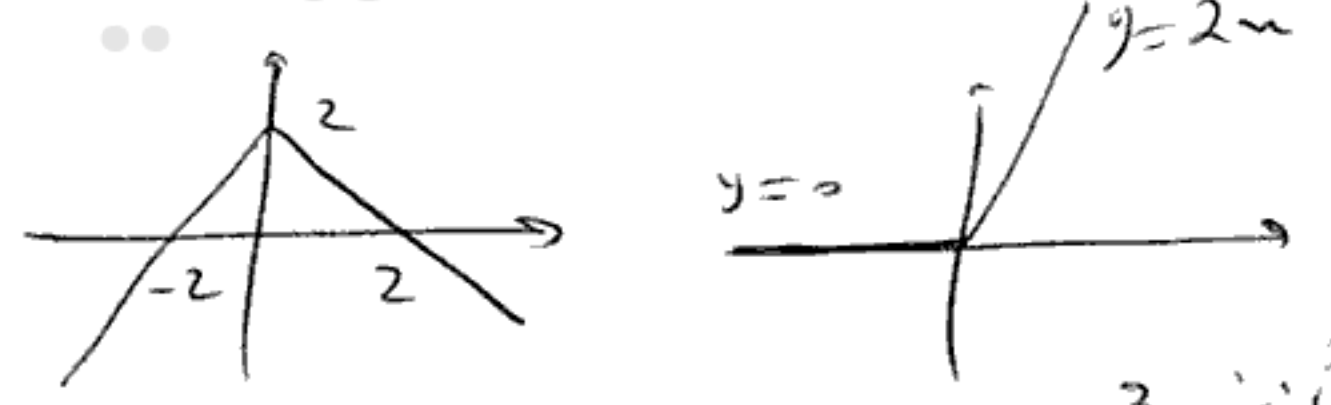
$\log_8(2x-1) = \log_8(2 \cdot \frac{5}{2} - 1) = \log_8(4) = \frac{2}{3}$

زنگنه 3  
 122 - 3

- $a_1 = 1$
- $a_2 = 2a_1 + 1 = 3$
- $a_3 = 2a_2 + 1 = 7$
- $a_4 = 2 \cdot 7 + 1 = 15$
- $a_5 = 31$
- $a_6 = 63$
- $a_7 = 127$
- $a_8 = 255$

زنگنه 4

127 -  $y = 2 - |x|, y = x + |x|$



زنگنه 3

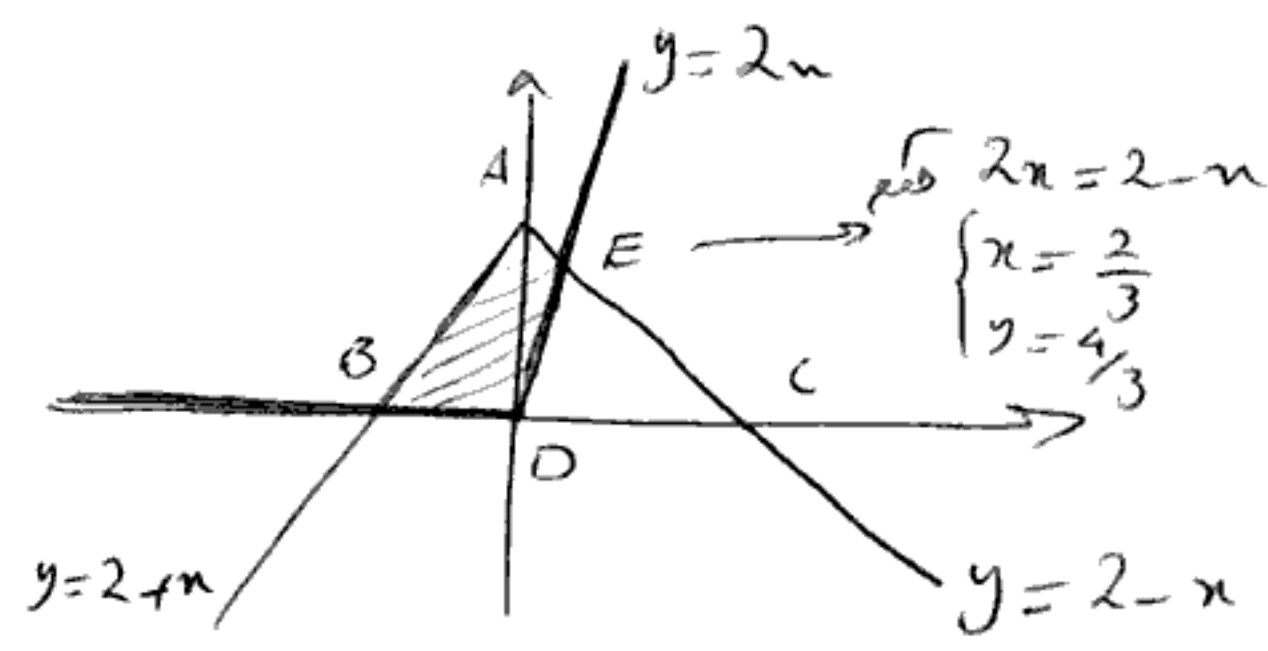
129 -  $A = \begin{bmatrix} 2 & 4 \\ 1 & 3 \end{bmatrix}, B = \begin{bmatrix} 2 & 0 \\ -3 & 1 \end{bmatrix}$

$A \times B = \begin{bmatrix} 2 & 4 \\ 1 & 3 \end{bmatrix} \begin{bmatrix} 2 & 0 \\ -3 & 1 \end{bmatrix} = \begin{bmatrix} -8 & 4 \\ -7 & 3 \end{bmatrix}$

$\det(A \times B) = -24 - (-28) = 4$

$(A \times B)^{-1} = \frac{1}{4} \begin{bmatrix} 3 & -4 \\ 7 & -8 \end{bmatrix}$

زنگنه 1



$S_{AEDB} = S_{ABC} - S_{EDC}$   
 $= \frac{1}{2} \cdot 4 \cdot 2 - \frac{1}{2} \cdot 2 \cdot \frac{4}{3}$   
 $= 4 - \frac{4}{3} = \frac{8}{3}$

- 133

$$\left| \frac{2-x}{2x-3} \right| > 1 \Rightarrow |2-x| > |2x-3|$$

2015/ب  
2015/د

$$\begin{cases} x < \frac{3}{2} & \text{---} \\ \frac{3}{2} < x < 2 & \text{---} \\ x > 2 & \text{---} \end{cases}$$

نتیجہ

2015/ب

$$4+x^2-4x > 4x^2-12x+9$$

$$\Rightarrow 3x^2-8x+5$$

نتیجہ = 0  $\Rightarrow$   $x = 1, \frac{5}{3}$

نتیجہ حلالت  $1 < x < \frac{5}{3}$

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

$$\Rightarrow \cos \left( \frac{3\pi}{2} - 2\alpha \right) = ?$$

نامہ 3

$$\Rightarrow -\sin(2\alpha) = ?$$

2015/ب

$$\sin \alpha - \cos \alpha = \frac{1}{2} \xrightarrow{2} \sin^2 \alpha + \cos^2 \alpha - 2\sin \alpha \cos \alpha = \frac{1}{4}$$

$$\Rightarrow 1 - \sin 2\alpha = \frac{1}{4}$$

$$\Rightarrow -\sin 2\alpha = -\frac{3}{4}$$

نتیجہ 2

1-134

$$70^\circ + 75^\circ + 35^\circ + 10^\circ = 280^\circ \quad -130$$

$$360^\circ - 280^\circ = 80^\circ$$

$$80^\circ \rightarrow 32$$

$$75^\circ \rightarrow ?$$

نتیجہ  $\rightarrow ? = 30$



نتیجہ 2

-131

$$C.V = \frac{s}{\bar{x}} = 0.2 \Rightarrow s = 0.2\bar{x}$$

$$\bar{x} = \frac{\sum x_i}{n} = 15 \Rightarrow s = 3$$

$$s^2 = \frac{\sum x_i^2}{n} - \bar{x}^2$$

$$9 = \frac{\sum x_i^2}{n} - 225 \rightarrow \frac{\sum x_i^2}{n} = 234$$

نتیجہ 3

132 - فرم :  $\binom{5}{3} \times 3! = 60$

حالات معلوم : ضرب 3  
بابت جمع اراٹم ضرب 3 باس

- 1,2,3
- 1,3,5
- 2,3,4
- 3,4,5

$$4 \times 3!$$

$$P = \frac{4 \times 3!}{\binom{5}{3} \times 3!} = 0.4$$

حالات زیر :

نتیجہ 2



$$\lim_{x \rightarrow \infty} \frac{C_{2n} - \sqrt{C_{2n}}}{\sum_{i=1}^n C_{2i}}$$

$$x \rightarrow \infty \quad \sum_{i=1}^n C_{2i}$$

$$= \lim_{x \rightarrow \infty} \frac{1 - \frac{x^2}{2} - (1 - \frac{1}{2} \frac{x^2}{2})}{x^2}$$

$$x \rightarrow \infty \quad x^2$$

$$= \lim_{x \rightarrow \infty} \frac{-\frac{x^2}{2} + \frac{x^2}{4}}{x^2} = -\frac{1}{4}$$

استدلال  $\lim_{x \rightarrow \infty} f(x) = f(a) \Rightarrow a = -\frac{1}{4}$

نتیجه

$$f(x) = \left(\frac{x+2}{2x-3}\right)^{\frac{3}{2}} \Rightarrow f'(2) = ? \quad -138$$

$$f'(x) = \frac{3}{2} \left(\frac{-7}{(2x-3)^2}\right) \sqrt{\left(\frac{x+2}{2x-3}\right)}$$

$$x=2 \rightarrow \frac{3}{2} \cdot \frac{-7}{1} \cdot 2 = -21$$

نتیجه

مسئله  $-139$

برای A, B

$$P(A \cup B) = P(A) + P(B) - P(A) \cdot P(B)$$

$$= 0.9 + 0.8 - (0.9) \cdot (0.8)$$

$$= 0.98$$

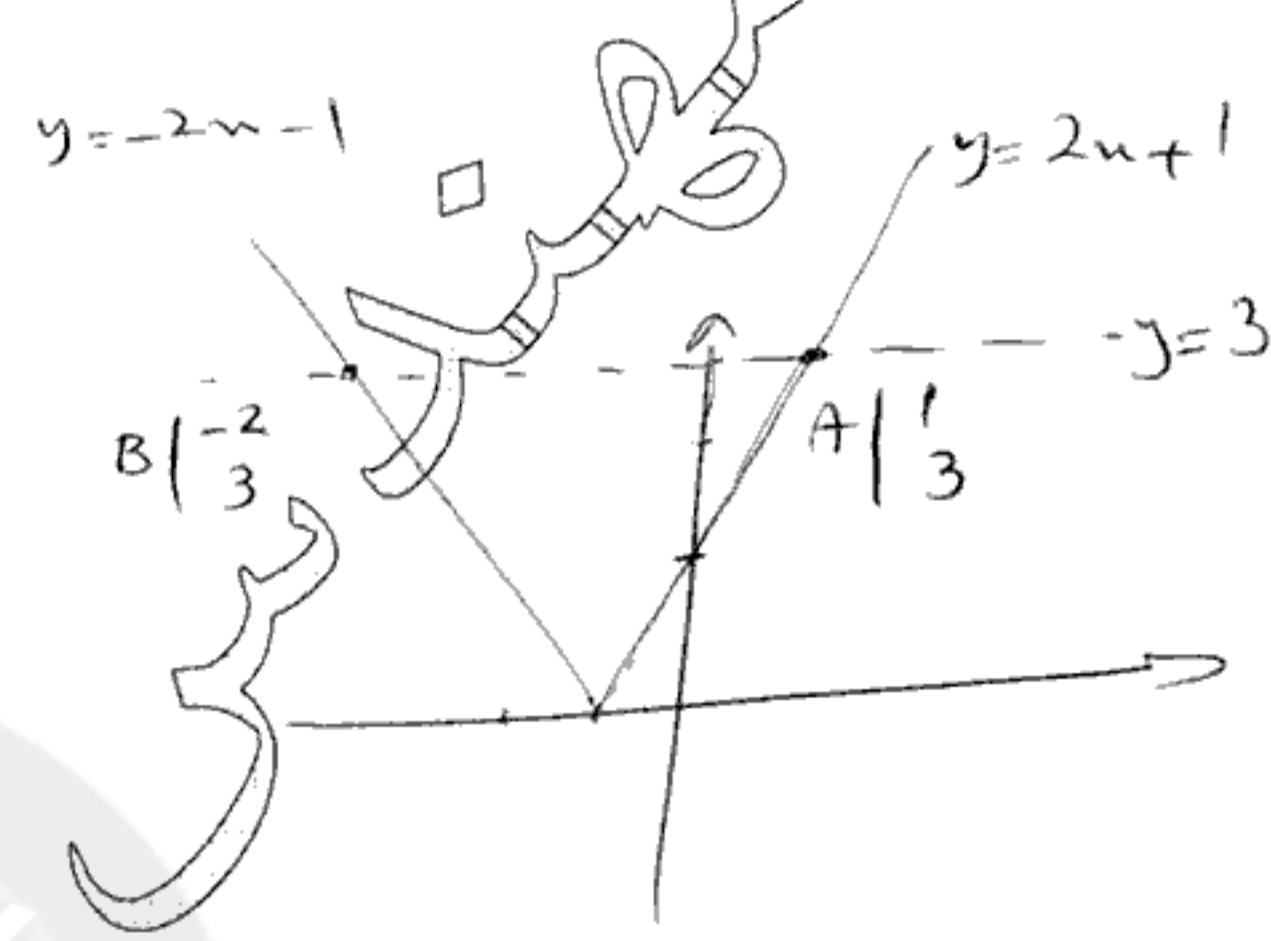
نتیجه

$$f(x) = x^2 + x$$

$$g(x) = \sqrt{4x+1}$$

$$\Rightarrow g \circ f = \sqrt{4(x^2+x)+1}$$

$$\Rightarrow g \circ f = \sqrt{4x^2+4x+1} = \sqrt{(2x+1)^2} = |2x+1|$$



$$S = \frac{1}{2} \cdot 3 \cdot 3 = \frac{9}{2}$$

نتیجه

$$f(x) = \frac{ax + \sqrt{4x^2+5}}{2x+2} \quad -136$$

$$\lim_{x \rightarrow \infty} f(x) = \frac{5}{2}$$

$$\lim_{x \rightarrow \infty} \frac{ax + (2x)}{2x} = \frac{(a+2)}{2} = \frac{5}{2}$$

$$a = 3$$

$$\lim_{x \rightarrow \infty} \frac{3x + \sqrt{4x^2+5}}{2x+2} \stackrel{HOP}{=} \Rightarrow$$

$$\frac{3 + \frac{8x}{2\sqrt{4x^2+5}}}{2} = \frac{3 + \frac{-4}{3}}{2}$$

$$= \frac{5}{6}$$

$$2\sin^2 + 3\cos = 0 \quad -143$$

$$2(1 - \cos^2) + 3\cos = 0$$

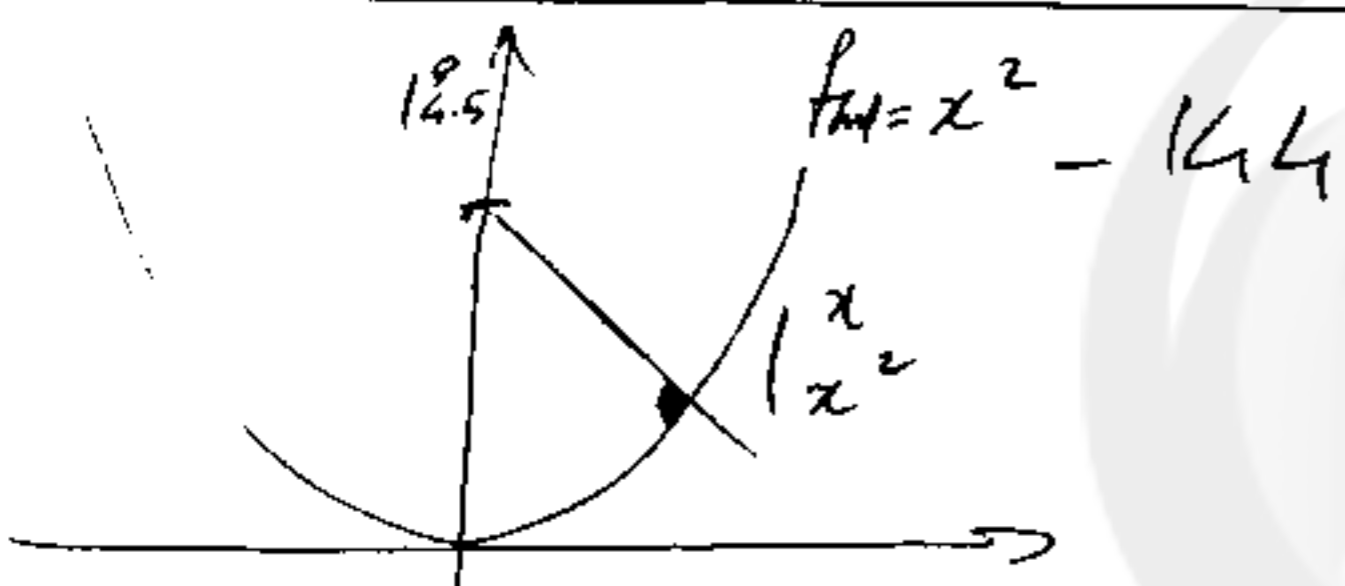
$$-2\cos^2 + 3\cos + 2 = 0$$

$$\Delta = 9 + 16 = 25$$

$$P_{1/2} = \frac{-3 \pm 5}{-4} = \begin{cases} 2 & \text{قوة} \\ -\frac{1}{2} & \end{cases}$$

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

نتیجه 1



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

$$\frac{x^2 - 4.5}{x} = -\frac{1}{2x}$$

$$\frac{x^2 - \frac{9}{2}}{x} = -\frac{1}{2x}$$

$$\rightarrow x^2 - \frac{9}{2} = -\frac{1}{2} \Rightarrow x^2 = 4$$

$$x = 2, -2$$

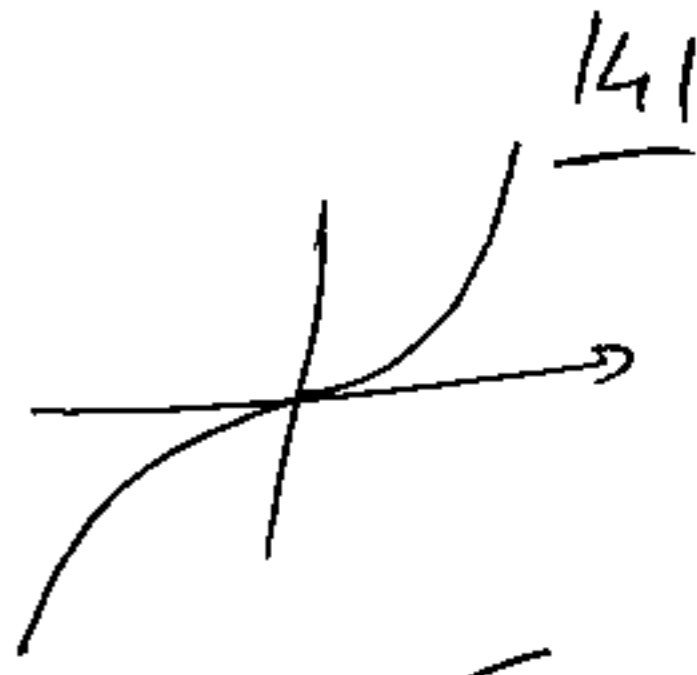
نتیجه 2

$$\frac{\binom{6}{4} \left(\frac{3}{4}\right)^4 \left(\frac{1}{4}\right)^2}{\binom{6}{3} \left(\frac{3}{4}\right)^3 \left(\frac{1}{4}\right)^3}$$

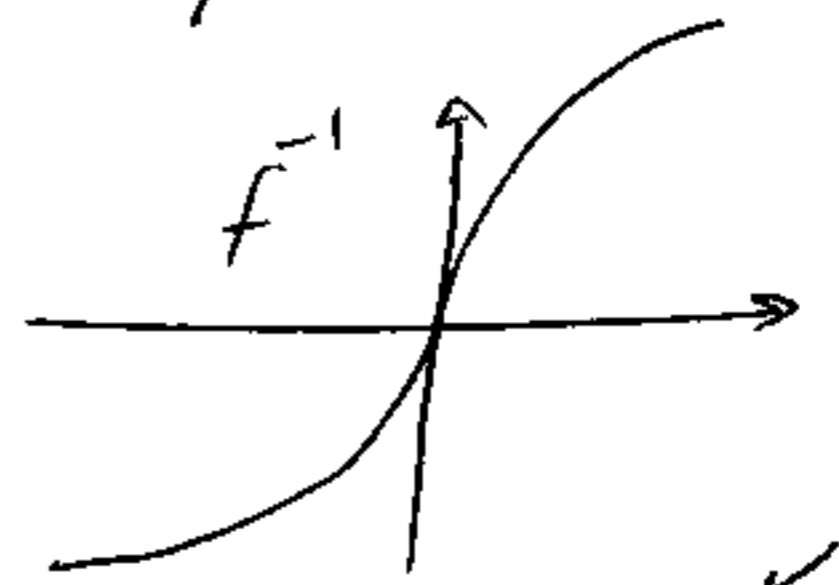
$$= \frac{15 \left(\frac{3}{4}\right)}{20 \left(\frac{1}{4}\right)} = \frac{45}{20} = \frac{9}{4}$$

نتیجه 4

$$f(x) = x/|x| \rightarrow$$



$$f^{-1}$$



نتیجه 3

$$a_1, a_2, a_3, \dots \quad -142$$

$$a_1 = \frac{1}{2} (S_{\infty} - a_1)$$

$$2a_1 = S_{\infty} - a_1 \Rightarrow 3a_1 = S_{\infty}$$

$$\Rightarrow 3a_1 = \frac{a_1}{1-r} \Rightarrow 1-r = \frac{1}{3}$$

$$r = \frac{2}{3}$$

نتیجه 3

$$f(x) = x^4 + ax^3 + bx$$

$$f'(x) = 4x^3 + 3ax^2 + b$$

مشتقات

$x=0$  , , ,

الفرضيات  $f'(x) = 0$  عند  $x=0$  فقط

$\rightarrow b=0$   $f' = x^2(4x + 3a) = 0 \rightarrow x=0$   
 الخيارات:  $x = -\frac{3a}{4}$

$f(-4) = 0 \Rightarrow 256 - 64a = 0 \Rightarrow a = 4$

$x = -\frac{3 \cdot 4}{4} = -3$

$f(-3) = 81 + 4(-3)^3 = -27$

3 گزینه

$0/2$   
 $1/-1$   $x - y - 1 = 0$

-148

$R = \frac{|2 - (-1) - 1|}{\sqrt{1+1}} = \sqrt{2}$

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

$y=0 \rightarrow (x-2)^2 + 1 = 2 \rightarrow (x-2)^2 = 1$

$\begin{cases} x-2=1 \rightarrow x=3, 1 \\ x-2=-1 \end{cases}$

1 گزینه

-149

$Kx^2 - 2(y^2 - 2y + 1 - 1) = 4$

$Kx^2 - 2(y-1)^2 + 2 = 4$

$Kx^2 - 2(y-1)^2 = 2$

4 گزینه

$\frac{x^2}{\frac{2}{K}} - \frac{(y-1)^2}{1} = 1$

$\frac{2}{K}$

1

$a^2$

$b^2$

$c^2 = a^2 + b^2$

$c = \sqrt{1 + \frac{2}{K}}$

$e = \frac{c}{a} = \frac{\sqrt{1 + \frac{2}{K}}}{\sqrt{\frac{2}{K}}} = \sqrt{3}$

$x + \sqrt{xy} + y = 12$

$\rightarrow 1 + \frac{1 \cdot y + y'x}{2\sqrt{xy}} + y' = 0$

derim  $m=1 \rightarrow$   $y' = -1$

$1 + \frac{y-x}{2\sqrt{xy}} - 1 = 0 \Rightarrow \frac{y-x}{2\sqrt{xy}} = 0$

$\Rightarrow y = x$

$x + \sqrt{x^2} + x = 12$

$\Rightarrow x + |x| + x = 12 \Rightarrow x = 4$

3 گزینه

$f(x) = \frac{1}{3}x^3 - x^2 - 15x$

$[-4, 3]$

$f'(x) = x^2 - 2x - 15 = (x-5)(x+3)$

$\rightarrow x = 5, x = -3$

مقادیر  
 مقادیر

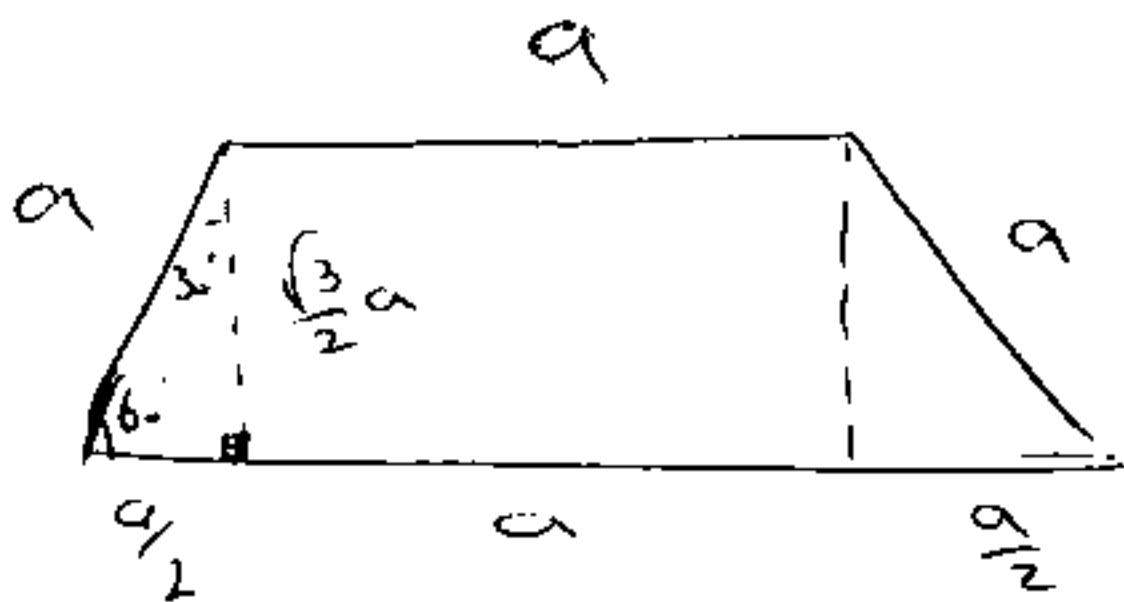
$x = -3 \rightarrow y = -9 - 9 + 45 = 27 = \text{Max}$

$x = -4 \rightarrow y = -\frac{64}{3} - 16 + 60 = 22.6$

$x = 3 \rightarrow y = 9 - 9 - 45 = -45 = \text{min}$

2 گزینه





$$a + a + a + a + \frac{a}{2} + \frac{a}{2} = 30$$

$$5a = 30 \rightarrow a = 6$$

$$S = \frac{6 + 12}{2} \times \frac{\sqrt{3}}{2}(6) = 27\sqrt{3}$$

نیزه 2

فهرست اسامی ایرانی - اسامی عربی و لاتین

@konkur\_irani

09148021864

$$\int_{-1}^1 (|3x| - [x]) dx$$

$$\int_{-1}^0 -3x + 1 + \int_0^1 3x - 0$$

$$-3 \left[ \frac{x^2}{2} + x \right]_{-1}^0 + \left[ \frac{3x^2}{2} \right]_0^1$$

$$= 0 - \left( -\frac{3}{2} - 1 \right) + \frac{3}{2} - 0$$

$$= \frac{5}{2} + \frac{3}{2} = \frac{8}{2} = 4$$

نیزه 4

$$\int \frac{(\sqrt{x} - 1)(x + \sqrt{x})}{x^2}$$

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

$$= \int \frac{\sqrt{x}(x - 1)}{x^2} = \int \frac{x - 1}{x\sqrt{x}}$$

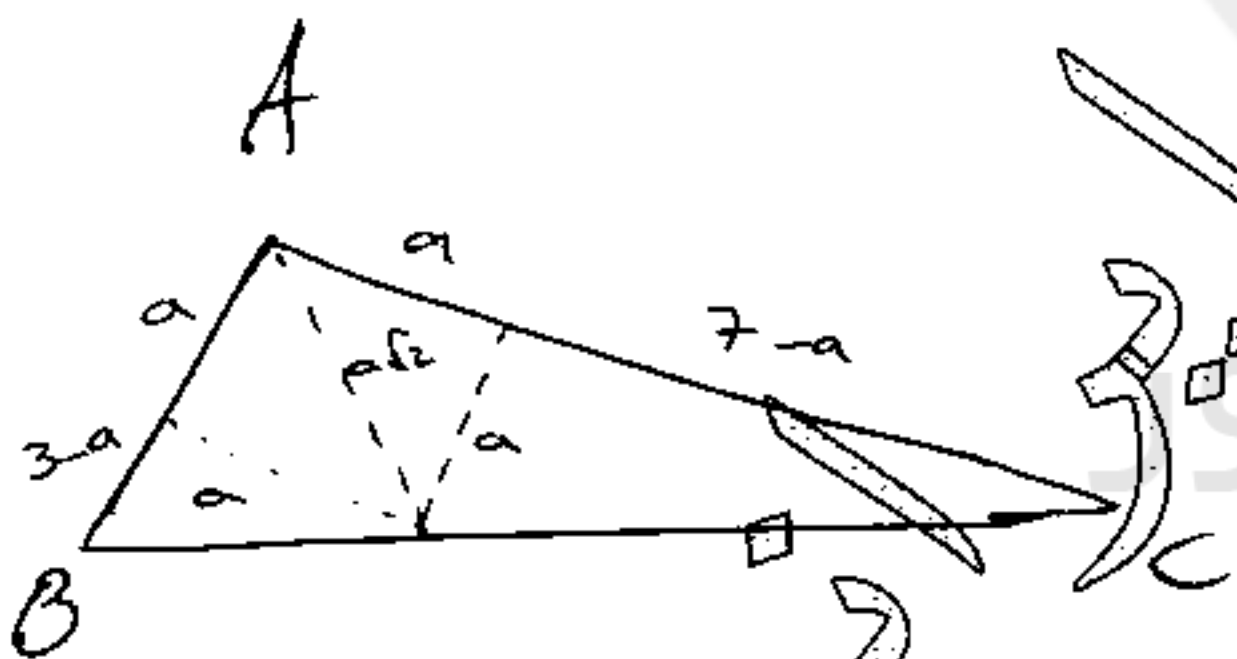
$$\rightarrow \int \frac{x}{x\sqrt{x}} - \int \frac{1}{x\sqrt{x}}$$

$$= \int x^{-\frac{1}{2}} dx - \int x^{-\frac{3}{2}} dx$$

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

$$= 2\sqrt{x} + \frac{2}{\sqrt{x}} = \frac{2x + 2}{\sqrt{x}}$$

نیزه 1

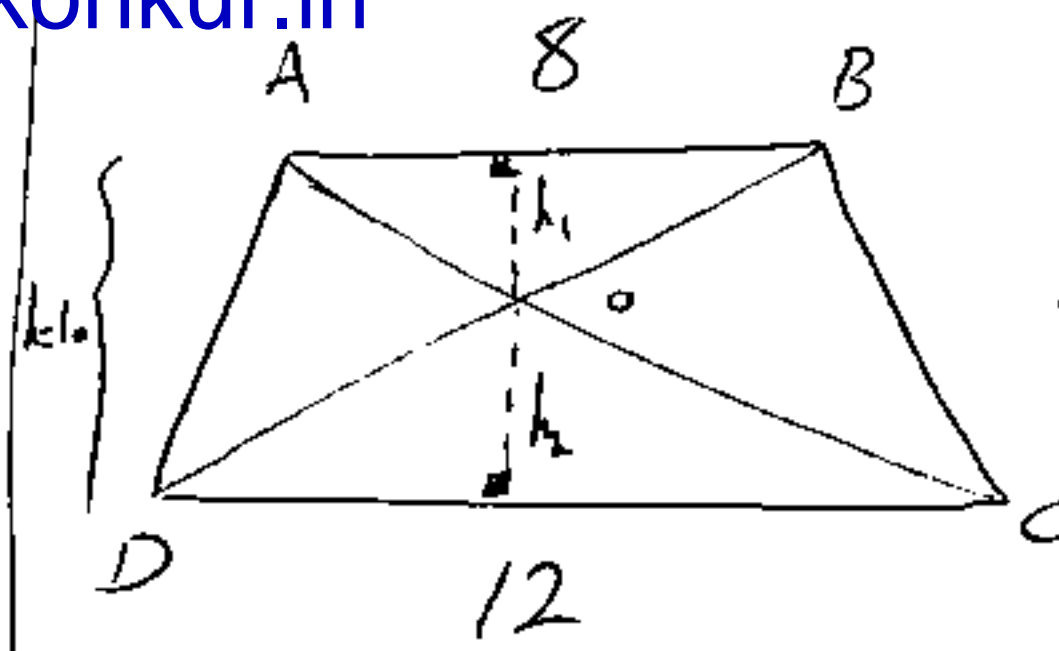


$$\frac{3-a}{a} = \frac{a}{7-a} \Rightarrow a^2 = a^2 - 10a + 21$$

$$\underline{a = 2.1}$$

$$h = a\sqrt{2} = 2.1\sqrt{2}$$

نیزه 4



154  
 این عدد را بنویسید

ارتفاع را 8 و 12 تقسیم کنیم به 4 و 6  
 $h_1 = 4$  و  $h_2 = 6$

$$S_{ABO} = \frac{8 \cdot 4}{2} = 16$$

$$S_{OBC} = \frac{12 \cdot 6}{2} = 36$$

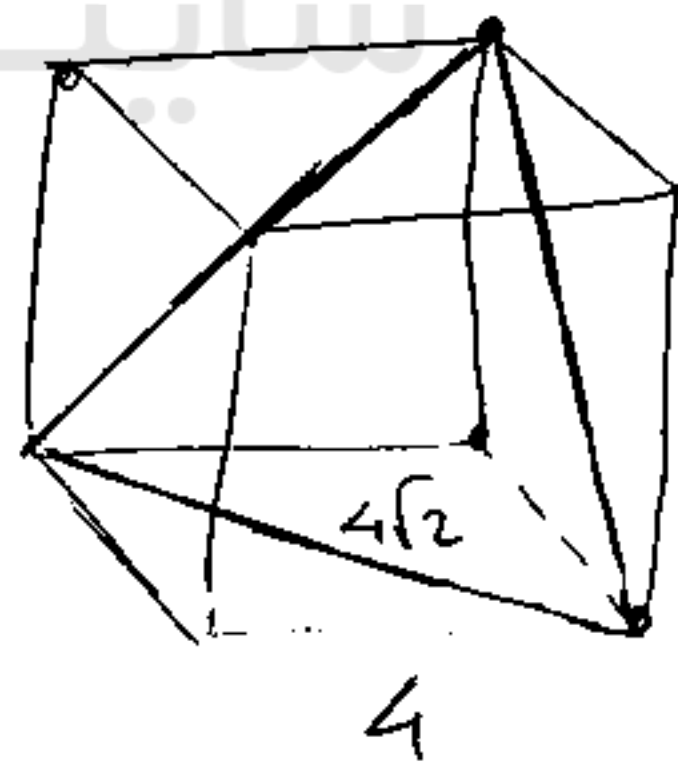
$$S_{ABCD} - S_{ABO} - S_{OBC} =$$

$$\frac{12+8}{2} \times 10 - 16 - 36 = 100 - 52 = 48$$

$$S_{AOD} = \frac{1}{2} \cdot 48 = 24$$

پس 3

اینجا



155

پس 4

$$S_{\Delta} = \frac{\sqrt{3}}{4} (4\sqrt{2})^2 = 8\sqrt{3}$$