



همراه شما
در مسیر یوس

پاسخ سوالات یوس ۲۰۲۰

دانشگاه استانبول



Istanbul University

INTERNATIONAL STUDENTS' EXAM

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$$\sqrt{\frac{\sqrt{x}+r}{\sqrt{x}-r}} = \sqrt{x}+r$$

مربع طرفین

$$\frac{\sqrt{x}+r}{\sqrt{x}-r} = (\sqrt{x}+r)^r \rightarrow (\sqrt{x}+r) = (\sqrt{x}+r)^r \times (\sqrt{x}-r)$$

$$1 = x-9 \rightarrow \underline{x=10} \quad \underline{E}$$

$$\frac{\frac{1}{10}\epsilon + \frac{1}{10}\epsilon}{\frac{1}{10}\epsilon + \frac{1}{10}\epsilon} = ? \rightarrow \frac{\epsilon \times 10^{-r} + 1 \cdot \epsilon \times 10^{-r}}{9 \times 10^{-r} + 1 \times 10^{-r}} \Rightarrow \frac{12 \epsilon \times 10^{-r}}{10 \times 10^{-r}} \rightarrow \frac{12 \epsilon \times 10^{-r}}{10 \times 10^{-r}} \rightarrow \underline{12 \times 10^{-r}}$$

$$ra+rb \neq 0 \quad \frac{a+b}{ra+rb} \times \frac{r}{r} \rightarrow \epsilon a + 4b = ra + rb \rightarrow rb = -a$$

$$\frac{b^r - ab}{ra^r - b^r} = ? \quad \begin{matrix} a \rightarrow rk \\ b \rightarrow -k \end{matrix} \rightarrow \frac{k^r + rk^r}{rk^r - k^r} \rightarrow \frac{\epsilon k^r}{10k^r} \rightarrow \left(\frac{\epsilon}{10} \right) \quad \underline{D}$$

as.

$$\left(\frac{a - \frac{9}{a}}{a^r - \epsilon a + r} \right) : \left(\frac{a+r}{1 - \frac{1}{a}} \right) = \frac{1}{11} \quad a = ?$$

$$\frac{\frac{a^r - 9}{a}}{(a-1)(a-r)} \times \frac{a-1}{a+r} \Rightarrow \frac{a-1}{(a-1)(a^r)} \rightarrow \frac{1}{a^r} = \frac{1}{11} \quad a^r = 11 \quad \underline{a = \sqrt[r]{11}} \quad \underline{A}$$

$$\begin{aligned} x - ry + \epsilon z &= -r \\ \epsilon x + 4y - rz &= 4 \end{aligned} \xrightarrow{\times r} \begin{aligned} x - ry + \epsilon z &= -r \\ 11x + 11y - \epsilon z &= 11 \\ \hline 9x + 9y &= 9 \quad \underline{x+y=1} \end{aligned}$$

$x+y = ?$

$$\frac{1}{100} \times \left(\frac{1}{r} \right)^r \times \frac{1}{10} \rightarrow \frac{1}{100} \times \frac{10^{-r}}{r^r} \times \frac{1}{10} \rightarrow \frac{10^{-r-1}}{r^r} \rightarrow \left(\frac{\epsilon}{r^r} \right) \quad \underline{D}$$

v)

$$f(x) = \begin{cases} x - 1 & x < 1 \\ \varepsilon - x & x > 1 \end{cases}$$

$$g(x) = \begin{cases} x - 1 & x < 1 \\ x - \varepsilon & x > 1 \end{cases}$$

$$g \circ f \circ g^{-1} \circ f^{-1}(-1) = ?$$

$$f^{-1}(-1) \rightarrow \varepsilon - x = -1 \quad x = \delta$$

$$g^{-1}(\delta) \rightarrow x - \varepsilon = \delta \quad x = 9$$

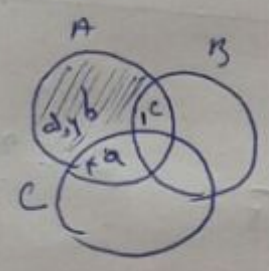
$$g \circ f(9) \rightarrow \varepsilon - x = 9 \quad x = -\delta$$

$$g(-\delta) \rightarrow x - \varepsilon = -\delta \rightarrow -13 \quad \underline{\underline{A}}$$

$$A \cup B \cup C = \{1, 2, 3, \varepsilon, \delta, 4, \nu, \lambda\}$$

$$A/B = \{\varepsilon, \delta, 4\}$$

$$A/C = \{1, \delta, 4\}$$



$$b + a \rightarrow \varepsilon, \delta, 4$$

$$b + c = 1, \delta, 4$$

$$B \cup C$$

$$\rightarrow \{1, 2, 3, \varepsilon, \nu, \lambda\}$$

B

$$z = \frac{\varepsilon - \varepsilon i}{\sqrt{1+i}} \Rightarrow z^{\wedge}$$

$$z = \frac{(1-i)}{\sqrt{1+i}} \rightarrow \frac{(1-i)}{\sqrt{1+i}} \cdot \frac{\sqrt{1+i}}{\sqrt{1+i}} \rightarrow \frac{\sqrt{1+i} + i}{-1} \rightarrow \left(\frac{1+i}{-1}\right)^{\wedge} \rightarrow \frac{(1+i)^{\varepsilon}}{14} \rightarrow \frac{\sqrt{1+i}^{\varepsilon}}{14} \rightarrow \textcircled{1}$$

B

$$g(x) = \frac{x^r - \nu x - r}{n+r}$$

$$h \circ g(x) = x \quad f(-r) = ?$$

$$\hookrightarrow h\left(\frac{x^r - \nu x - r}{n+r}\right) = x \rightarrow \frac{x^r - \nu x - r}{n+r} = -r$$

$$x^r - \nu x - r = -r x - r$$

$$x^r - \varepsilon x + \varepsilon =$$

$$\frac{x^r - \varepsilon x + \varepsilon}{x-r}$$

$$\text{II} \quad A = \frac{r}{r - \frac{1}{r}} \Rightarrow \left(\frac{r}{0}\right)$$

$$B = \frac{r}{r - \frac{1}{r}} \Rightarrow \left(\frac{0}{0}\right)$$

$$\frac{r-A}{r-B} = ? \quad \frac{r - \frac{r}{0}}{r - \frac{0}{0}} \rightarrow \frac{\frac{r}{0}}{\frac{r}{0}} \rightarrow 1$$

III

$$\text{II} \quad \log_{1/r} M = x$$

$$\log_{1/r} 9 = ? \rightarrow y$$

$$1r^n = 1A \rightarrow r^x \times r^y = r^r \times r^r \rightarrow r^{n-r} = r^{1-2r}$$

$$4y = 9 \rightarrow r^y \times r^y = r^r \rightarrow r^{2y-r} = r^r$$

$$\frac{x-r}{r-y} = \frac{1-2r}{y} \rightarrow \frac{y}{r-y} = \frac{1-2r}{x-r}$$

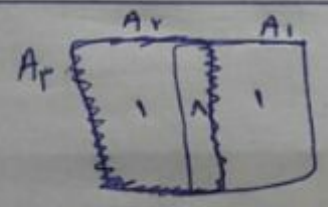
$$\left(\frac{r-y}{y}\right) = \frac{x-r}{1-2r}$$

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

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

$$\frac{-x-1}{1-2r} = \frac{r}{y} \rightarrow y = \frac{r(-x-1)}{-2r-1} \rightarrow y = \frac{\sum n - r}{n+1}$$

III



$$\rightarrow \frac{1}{-1} = \frac{1}{-1}$$

A

$$\text{II} \quad h(n) + r h(1-n) + x^r = ? \quad h(1) = ?$$

$$n=0 \quad h(0) + r h(1) + 0 = ? \xrightarrow{x-r} -r h(0) - 9 h(1) = ?$$

$$n=1 \quad h(1) + r h(0) + 1 = ? \quad h(1) + r h(0) = -1$$

$$-1 h(1) = -1$$

$$h(1) = \frac{1}{r}$$

A

13 $A + E = 40 \rightarrow A + E = 4.$

$\frac{1}{10} E + \frac{1}{100} A = 4 \rightarrow 10E + 10A = 400.$

$10E = 400 - 10A \rightarrow 10A \times \frac{9}{10} \rightarrow \frac{9A}{1} \rightarrow \underline{\underline{9A}}$ B

14 $a, b, x, y > 0.$

$\frac{x}{a} \cdot \frac{b}{y} = 4 \rightarrow \frac{x}{a} = \frac{4y}{b} \quad \frac{x}{a} = 4k$
 $\frac{y}{b} = k$

$\frac{a^r}{x^r} + \frac{b^r}{y^r} = 5.$

$\rightarrow \frac{1}{9k^r} + \frac{1}{k^r} = 5 \rightarrow \frac{1+9}{9k^r} = 5 \rightarrow \frac{10}{9k^r} = 5 \quad k = \frac{1}{3}$

$\frac{x}{a} = \frac{1}{3} \quad \underline{\underline{x = \frac{a}{3}}}$ A

15 $\left(\frac{r^n + r^{-n} - 1}{r^n + r^{-n}} \cdot \frac{r^n - r^{-n}}{r^n + r^{-n}} \right)^{-1} = ?$

$\left(\frac{r^n + r^{-n} - 1}{r^n + r^{-n}} \times \frac{r^n + r^{-n}}{r^n - r^{-n}} \right)^{-1} \rightarrow \underline{\underline{r^n - r^{-n}}}$ B

16 $a_1 \quad a_2 \quad a_3 \quad a_4 \quad a_5 \dots a_n$
 $\underbrace{1}_{+1} \quad \underbrace{r}_{+r} \quad \underbrace{r^2}_{+r^2} \quad \underbrace{r^3}_{+r^3} \quad \dots \quad \underbrace{r^{n-1}}_{+10}$

$\rightarrow 1 + r + r^2 + \dots + r^{n-1} \rightarrow \frac{1(r^n - 1)}{r - 1} \rightarrow \underline{\underline{110}}$

$110 + a_1 \rightarrow \underline{\underline{121}}$ A

17 $\frac{\sin(\frac{r}{y} + n) - \cos(\pi - n)}{\tan(\frac{r}{y} + n) + \cot(\pi - n)} \rightarrow \sin(-n) = ?$

$\frac{\cos n + \cos n}{-\cot n + -\cot n} \rightarrow \frac{2 \cos n}{-2 \frac{\cos n}{\sin n}} \rightarrow -\sin n - \sin n \rightarrow -2 \sin n$ A

$$\sqrt{r}x - \sqrt{r}y = \sqrt{r} \xrightarrow{\times \sqrt{r}} rx - ry = r$$

$$\sqrt{r}x + \sqrt{r}y = \varepsilon \sqrt{r} \xrightarrow{\times \sqrt{r}} \sqrt{r}x + ry = \varepsilon r$$

$$\rightarrow rx = \varepsilon r \sqrt{r}$$

$$\underline{\underline{x = \sqrt{r}}}$$

$$r(r - ry) = r \quad r - y = 1 \quad \underline{\underline{y = 1}}$$

$$\frac{\sqrt{r}}{1} = \sqrt{r} \quad \underline{\underline{B}}$$

21) $x \cdot y \cdot z = 24$

$(1, 1, 24) \rightarrow 264$ $(2, 2, 6) \rightarrow 264$

$(1, 2, 12) \rightarrow 264$ $(2, 3, 4) \rightarrow 264$

$(1, 3, 8) \rightarrow 264$ $(2, 3, 4) \rightarrow 264$

$(1, 4, 6) \rightarrow 264$

$\rightarrow 264$ $\underline{\underline{D}}$

$$P(x) = x^3 + ax^2 + bx + c$$

$$P(x) = (x+r)g(x)$$

$$P(0) = 0$$

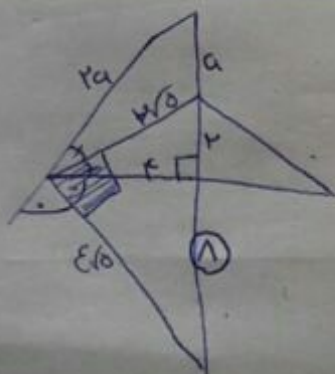
$$P(0) = b = 0 \rightarrow b = 0$$

$$P(-r) = 0$$

$$P(-r) = -r^3 + \varepsilon a - ra + 1 \rightarrow P(-r) = r + ra$$

$$a = -1 \rightarrow 1 + -1 \rightarrow \underline{\underline{9}}$$

E



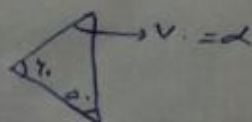
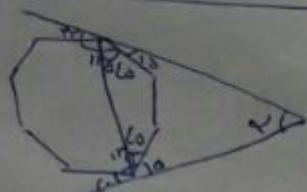
$$(r/2)^2 = \varepsilon a - ra$$

$$r = \varepsilon a$$

$$a = \frac{1}{\varepsilon}$$

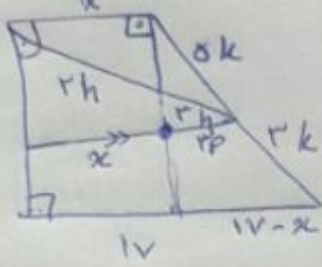
$$\frac{1}{\varepsilon} + 1 \rightarrow \underline{\underline{\left(\frac{\varepsilon + 1}{\varepsilon}\right)}}$$

A



C

23



$r_p = \rightarrow \frac{r_k}{r}$

$$\frac{> D}{> D} = \frac{r_k}{r} \cdot \frac{1}{IV-x}$$

$$\frac{> D}{> D} = \frac{r_k}{r \cdot \epsilon - c_n}$$

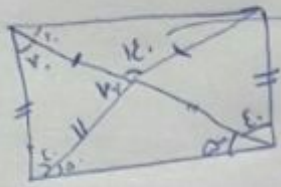
$$r \cdot \epsilon \cdot n = r \cdot \epsilon \cdot \alpha \cdot d - 1 \cdot x$$

$$r \cdot \epsilon \cdot n = r \cdot \epsilon \cdot \alpha \cdot d$$

$n = \alpha$

A

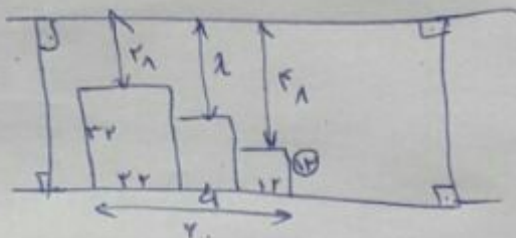
24



$\epsilon \epsilon$

D

25

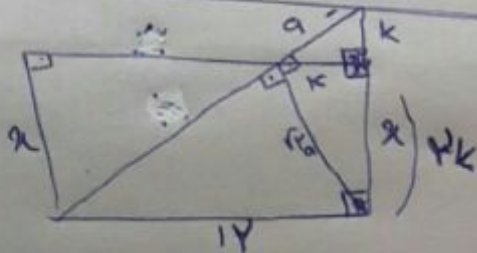


$\alpha \rightarrow 17$

$4-x \rightarrow \epsilon \epsilon$

E

26

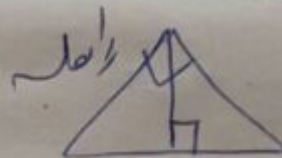


$$k \cdot x \cdot r_k = \epsilon^r$$

$$r_k^r = 17$$

$$k = r \cdot r$$

$$\alpha = r_k \rightarrow \epsilon \sqrt{r}$$



C

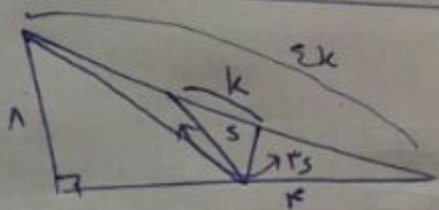
27



$$\frac{2r^r}{\epsilon} + 17 \rightarrow \underline{\underline{r_k + 17}}$$

D

28



$$\frac{\epsilon \alpha \lambda}{\gamma} \rightarrow (17)$$

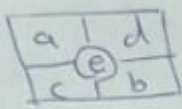
$\epsilon s = 17$

$s = \epsilon$

$s = \epsilon$

B

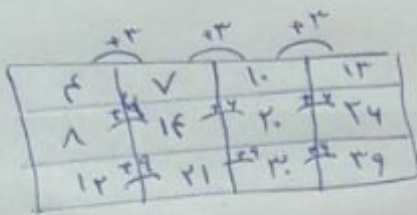
۳۱ $|a-b| + |d-c| = e$



$x = |18 - 10| + |12 - 12| \rightarrow 8 + 0 \rightarrow 8$

U

۳۲



$A + B + C$

$C \rightarrow 21 \quad A \rightarrow 12 \rightarrow 12 + 21 + 2 = 35$

$B \rightarrow 2$

U

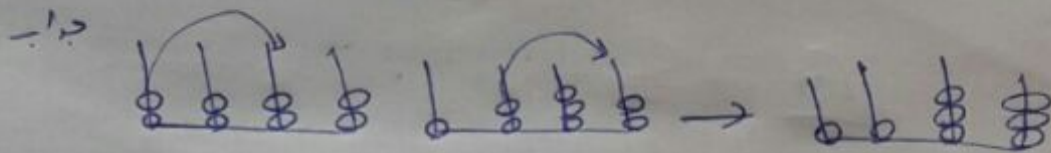
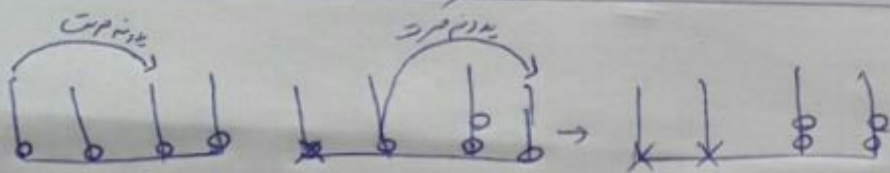
۳۳

این مسئله مورد
گفتی من بعد سینه من



D

۳۴



باز کردن



۳۵

$(2 * 3) * 15$

$2 * 3 \rightarrow 3 + 3 + 2 \rightarrow 8$
درجه اول

$12 * 15 \rightarrow 12 + 13 + 14 + 15 \rightarrow 54$

درجه اول

E

۳۶

$\frac{T(2)}{T(1)} \Rightarrow \frac{2(2)(2)(2)}{2(1)(1)(1)} \rightarrow \left(\frac{4}{1}\right)$

B

27 $\frac{1}{r} \cdot \frac{1}{r}, \frac{y}{d}, \sum, \frac{10}{v}, 10, x$

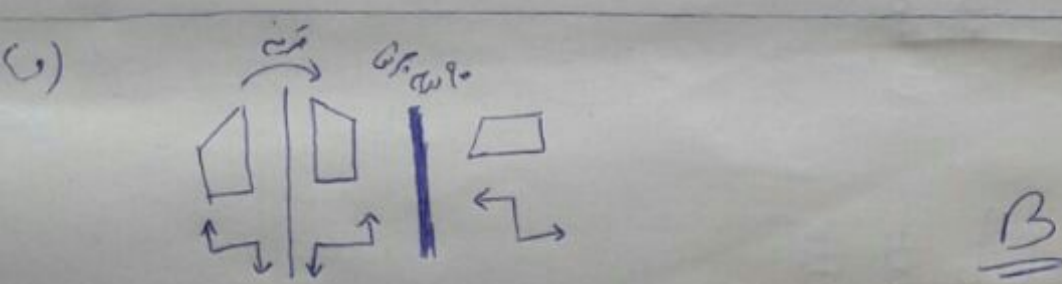
$\frac{1}{r} \cdot \frac{1}{r} = \frac{1}{r^2}$, $\frac{y}{d}$, $\frac{10}{v}$, 10 , x
 $\frac{1}{r^2} \cdot \frac{y}{d} = \frac{y}{dr^2}$, $\frac{10}{v} \cdot 10 = \frac{100}{v}$, $\frac{10}{v} \cdot x = \frac{10x}{v}$
 $\frac{y}{dr^2} + \frac{100}{v} + \frac{10x}{v} = \dots \rightarrow \text{27}$
A

28 $a + \omega = b$
 $r - rb = -a \rightarrow rb - a = r$
 $b - a = \omega$
 $\left. \begin{array}{l} x - b = -\omega \\ rb - a = r \end{array} \right\} \rightarrow \underline{b = -r}$
D

29

ϵ	v	$r+a$	y	$\rightarrow 19+a$
q	r	r		
y		Δ		
a	1	1	x	$\rightarrow 19+a$

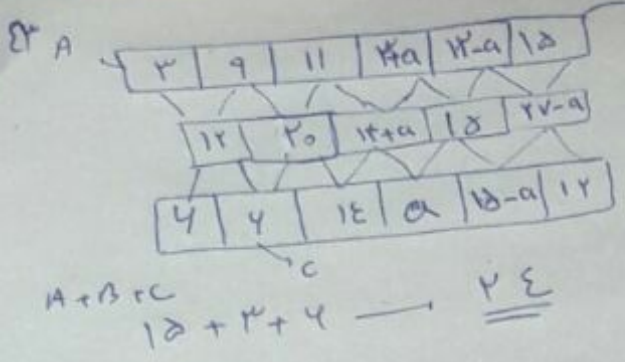
\downarrow $19+a$ \downarrow $19+a$ $x=1$
A



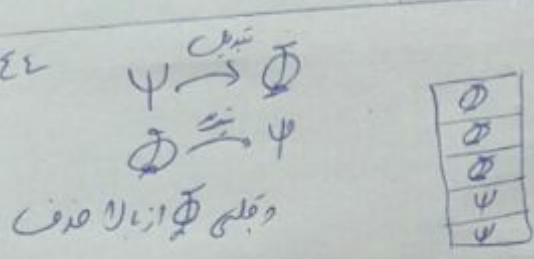
31 $A_n = A_{n+\epsilon}$

$rv - ra = r1 \checkmark \rightarrow Arv = Ar1 \Rightarrow 10$
 $a=r$
 $10 + \Delta + v + 10 \rightarrow \text{32}$
 $9r - \Delta r = rk \checkmark \rightarrow A9r = A\Delta r \Rightarrow \Delta$
 $11 - \epsilon = rh \checkmark \rightarrow A11 = A\epsilon \Rightarrow v$
 $v2 - rv = rp \checkmark \rightarrow Av2 = Arv \Rightarrow 10$
B

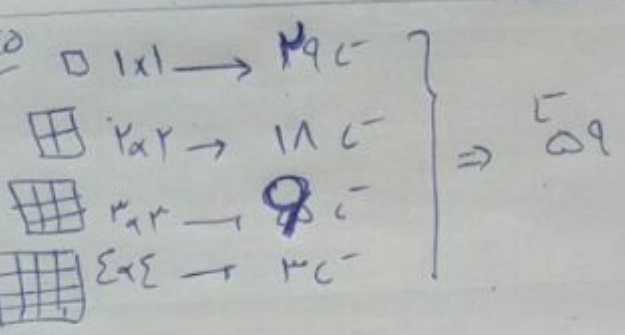
32 $\frac{1!}{2!} \rightarrow 1 \times v \times 4 \Rightarrow \text{334}$
E



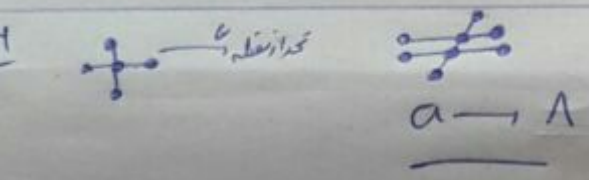
U



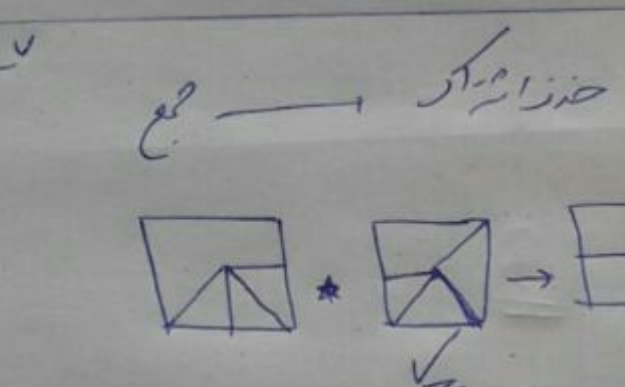
D



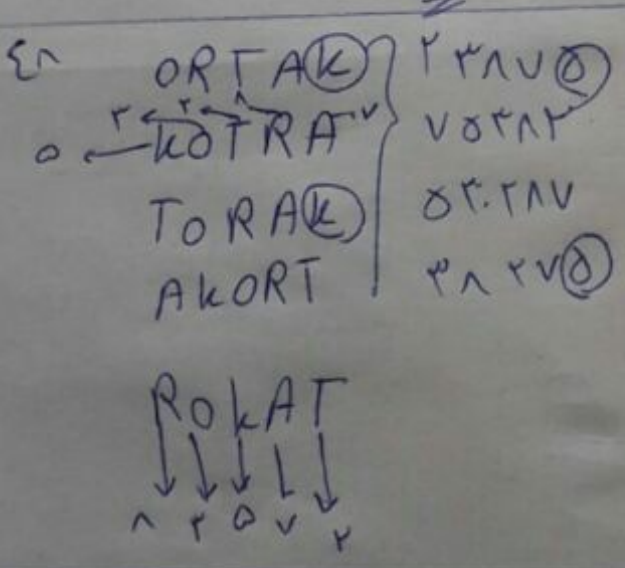
C



E



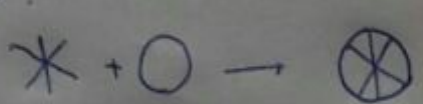
U



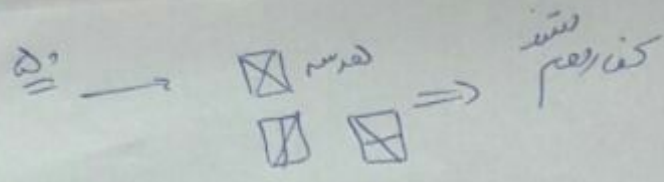
E

مستقل بعد + مستقل بعد = مستقل بعد

چرخش مدار = مستقل بعد



$\ast \rightarrow \text{مربع } A$



$A, B, C \in \rightarrow$ درستی هم
صفتی هم

صواب نیست

51 $141, 45, 25, 5, 25, 35, 2 \rightarrow \alpha = 50$

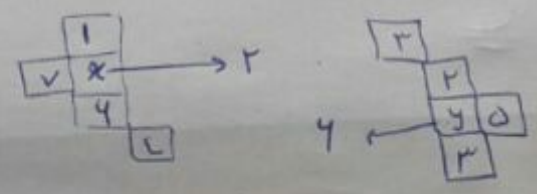
$\times 5$ جمع ارقام چپ

A



A

53 تبدیل نقشه
از درج جدول به



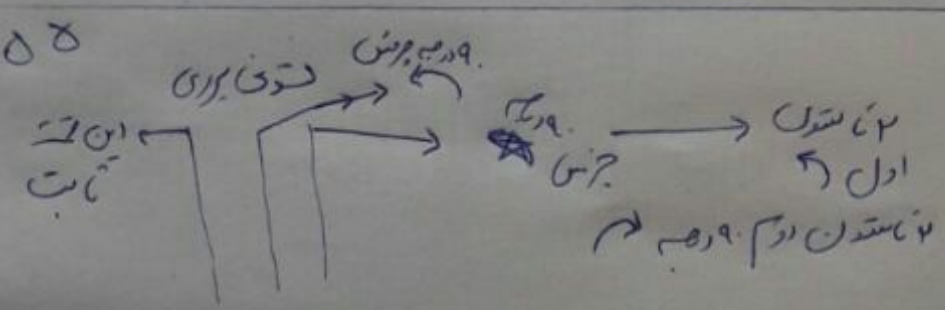
$4 + 2 = 6$

C

54 کدام اول
 $(4 \times 4) \times 2 \rightarrow 32$
 $\rightarrow 19 \rightarrow$

$35 + 19 = 54$

B



$x = \leftarrow$
 $y = \leftarrow$

A

$\frac{\partial}{\partial a} a + c = 3d \rightarrow c = 2$

$ac = 18c \rightarrow a = 18$

$ab = 72c \rightarrow 18 \times b = 72 \times 2 \rightarrow b = 24$

$b^2 - a^2 = ? \rightarrow (b-a)(b+a) \rightarrow (24-18)(24+18)$

21x21 \rightarrow 1, 5, 1
 رقم یکاں سے زیادہ
 یہ سمجھنا سہاگہ

E

52

2	3	4	5	1
3	2	2	1	4
4	1	5	2	3
5	4	1	3	2
1	5	3	4	5

2 = 1

E

57

$t = 2n$
 $m = n + 2$

$\frac{2n}{n+2} = \frac{48}{19}$

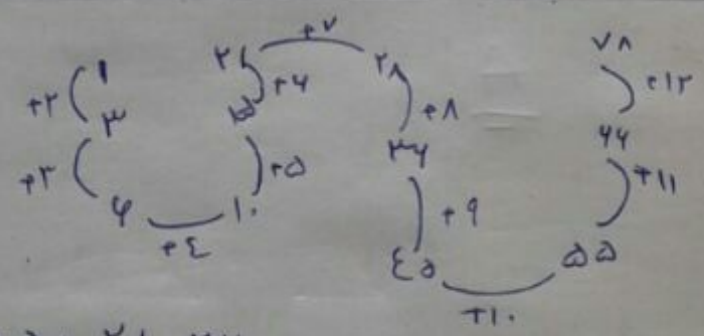
$\frac{n}{n+2} = \frac{14}{19}$

$\rightarrow 19n = 14n + 28$

$5n = 28 \rightarrow n = 14$

D

59



$50 + 21 + 24 \Rightarrow 115$

D

40

$a + c = f + b$
 $a + b = v + c$
 $b + c = a - r$
 $c + a - b = ?$

فرضاً $a - b = v + b - a \rightarrow 2a - 2b = v \rightarrow a - b = \frac{v}{2}$

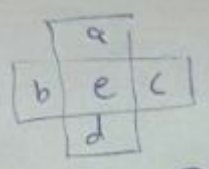
$b - a = -r - c$

$-r = -r - c \rightarrow c = 1$

$1 + 3 = 4$

E

41



$(a+b+c+d)e$

$(4+3+1+0) \times 2 \rightarrow 14$

D

42

$a * b = c$

$(a+b) \times 2$

$(5 * 7) * 2 \rightarrow (5+7) \times 2 \rightarrow 24 * 2 \rightarrow 48 \times 2 \rightarrow 96$

E

43

دایره سفید داخلی (مربع کوچک) \rightarrow 0
 ابتدا به سمت چپ 2 واحد می‌رود ... دایره سیاه دارد کرده

با قدرت کمترین A, C, D مانده

• بیرونی (مربع بزرگ) \rightarrow حرکت در جهت
 A و C مانده

• داخلی \rightarrow دارد کرده حرکت

A و B مانده

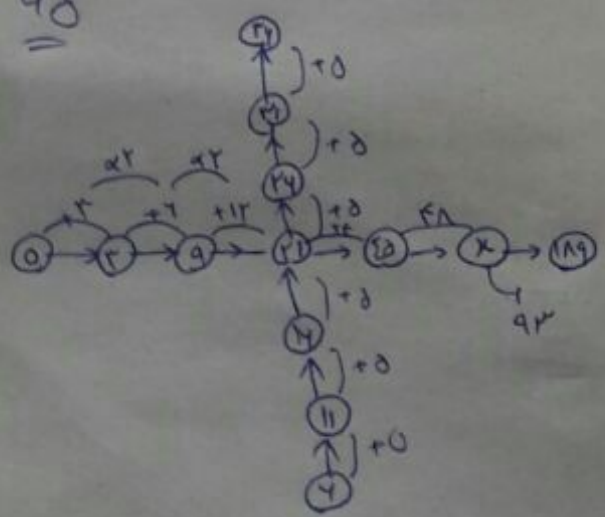
A

44

$2x + 3y - 4z = 1 \rightarrow -2z = -2 \rightarrow z = 1$
 $2x - 2z + 3y = 1$
 $3y + z - x = 4$
 $4z - 3y + x = 1 \rightarrow x = 1 - 4z + 3y$
 $3y + x - z = 1$
 $3x = 9 \rightarrow x = 3$
 $0 = 2$
 $4 + x - 1 = 1 \rightarrow x = 3 \Rightarrow *$

A

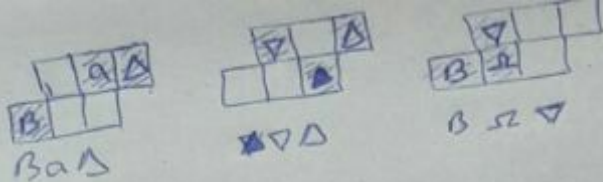
45



$9x + 31 \rightarrow 124$

C

44

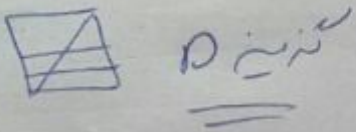
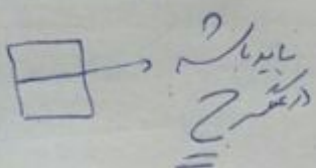


از دو سینه α

U

47

با رد کردن حل کرده



48

این اولی که تکراری نیست

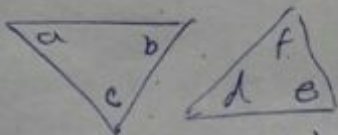
حداکثر تکراری

جای ۲ مرتبه آفرینش کرده

$$vxy2 \xrightarrow{*} vvxy2 \xrightarrow{\square} vvxy22$$

B

49



$$(a+b+c) - (d+e+f) = ?$$

$$\frac{(9+8+7)}{2} - \frac{(4+3+1)}{1} = 11$$

U

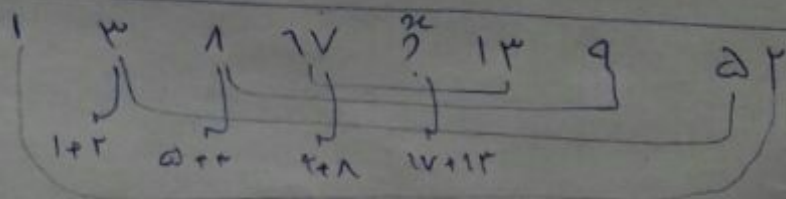
جمع کناری ها (متوسطی و بی متایی)

(سنتی بر ۲)

$$\frac{1+4}{2} = 5$$

U

51

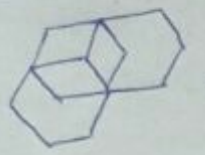


$$n = 2$$

B

۷۲

واحد از هر
تعدادی خود را جمع



گزینه C

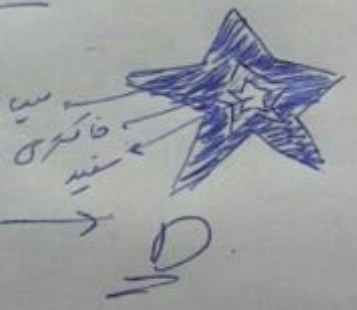


۳ → ۳ × ۳ × ۳ → ۲۷

۲۷ - ۱۷ → ۱۰

B

۱۴



در هر دایره
یک نقطه
سفید سیاه و فانی
تعدادی وجود ندارد

۱

۵

در هر دایره
از هر یک از اشکال یک بار استفاده شده
تعدادی وجود ندارد

سه دایره دیگر با هم

گزینه C

۷۴

آن شکل های را انتخاب کرده
که با هم در هر دایره



D


۷۷

$ab \rightarrow (a \times b)(a + b)$

$\frac{(4 \times 3)}{12} \frac{(4 + 3)}{7} = \frac{142}{84}$

B

۷۸


 حالت فشرده برای بدنه
 فرایع کم است \Rightarrow جابجایی کم است

+
 به حالت فشرده برای
 بدنه فرایع کم است

۷۹

برای
 اثر آرسنیک

کسر I, II \rightarrow برای آرسنیک
 کسر I, III \rightarrow اثر آرسنیک



A

۸۰

تعداد پروتونها \rightarrow ۲۵ = ۲۵
 (تعداد پروتونها)

C