

Junior Mathematical Challenge

Questions by Topic 2007 – 2018 Collection Last updated: August 18, 2020

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Comments and suggestions to 89272376 @QQ.com .



Answers

	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	
1	С	D	В	В	В	E	E	D	Α	В	Е	С	Α				1
2	D	Е	В	Е	Е	С	Е	В	Е	Α	D	D	E				2
3	В	В	D	A	В	E	С	С	D	E	D	Α	Α				3
4	Е	С	Е	D	С	С	С	Е	Α	С	Е	Е	Е				4
5	Е	Е	D	D	В	D	D	Α	В	Α	С	Α	С				5
6	Α	D	В	С	Е	D	Α	Α	В	С	D	D	В				6
7	D	С	С	Α	D	В	D	В	Α	Α	Α	В	Α				7
8	D	Α	Е	D	A	В	A	Α	С	Α	В	D	Α				8
9	С	Е	A	A	A	С	В	Е	D	E	D	С	В				9
10	D	В	В	Е	С	E	E	D	Е	D	Е	С	E				10
11	A	Е	С	С	С	В	С	D	D	С	В	D	D				11
12	Α	С	Α	С	Е	В	Е	В	В	В	D	Α	D				12
13	D	С	D	В	Е	С	D	Α	Α	С	С	D	E				13
14	Е	D	Е	D	Α	Α	В	D	Е	D	В	Е	D				14
15	С	В	Е	С	Α	E	Α	Е	С	E	Α	D	Е				15
16	В	Α	D	Е	В	D	В	Е	D	В	D	Е	С				16
17	С	В	A	D	D	A	Е	С	В	С	В	В	D				17
18	В	В	В	D	С	D	Α	Е	В	D	A	В	С				18
19	A	D	A	С	D	E	D	С	D	В	Α	С	В				19
20	Е	A	D	В	A	A	В	В	С	A	В	В	E				20
21	В	A	Е	С	В	В	С	D	С	A	С	D	D				21
22	D	D	D	Е	D	В	Е	С	Е	E	В	В	Α				22
23	E	В	С	Е	Е	A	D	D	D	В	Е	Α	В				23
24	С	Е	С	В	D	D	В	С	В	D	Е	В	В				24
25	В	D	В	Α	С	Α	С	Α	Е	D	Е	D	D				25





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	-				
Q1 : 200	08_Q10				
The face painted d	s of a cube an lifferent colo	re painted so urs. What is	that any two the smallest	faces which have number of colours	an edge in common are required?
A 2	В	3	C 4	D 5	E 6
Q2 : 200	8_Q12				
The sculp artist Fra from a so If all the sculpture	pture 'Cubo V nz Weissman olid cube to le edges have le	Vazado' [Em in is formed eave the sym ength 1, 2 or	nptied Cube] b by removing on metrical shape 3, what is the	y the Brazilian cubical blocks e shown. volume of the	
A 9	B 11	C 12	D 14	E 18	
Q3 : 201	.0_Q4				
If the ne is oppos	et shown is f ite X ?	olded to ma	ake a cube, w	which letter	C D
А	В	С	D	Ε	A X B E
Q4 : 201	1 014				
The diagonation one-quart The total area of or	ram shows a ter of the area surface area ne of the visil	cuboid in wl a of each of of the cuboi ble unshadeo	hich the area of the two visible d is 72 cm ² . V d faces of the o	of the shaded face i e unshaded faces. Vhat, in cm ² , is the cuboid?	S
The diagone-quart The total area of or A 16	ram shows a ter of the area surface area ne of the visil B 28.8	cuboid in wh a of each of of the cuboi ble unshaded C 32	hich the area of the two visible d is 72 cm ² . V d faces of the D 36	of the shaded face i e unshaded faces. Vhat, in cm ² , is the cuboid? E 48	s
The diagnone-quart The total area of or A 16 Q5 : 201	ram shows a o ter of the area surface area ne of the visil B 28.8	cuboid in wl a of each of of the cuboi ble unshadeo C 32	hich the area of the two visible d is 72 cm ² . V d faces of the of D 36	of the shaded face i e unshaded faces. Vhat, in cm ² , is the cuboid? E 48	S
The diagnone-quart The total area of or A 16 Q5 : 201 One cube cube, ma What, in	ram shows a of ter of the area surface area ne of the visil B 28.8 .1_Q20 e has each of king a solid a cm ² , is the su	cuboid in what of each of of the cuboid ble unshaded C 32	hich the area of the two visible d is 72 cm ² . V d faces of the of D 36 vered by one f The volume of of the solid?	of the shaded face i e unshaded faces. What, in cm ² , is the cuboid? E 48 Face of an identical the solid is 875 cm	n^3 .
The diagnone-quart The total area of or A 16 Q5 : 201 One cube cube, ma What, in A 750	ram shows a o ter of the area surface area ne of the visil B 28.8 .1_Q20 e has each of king a solid a cm ² , is the su B 800	cuboid in what of each of of the cuboid ble unshaded C 32 its faces cov as shown. T urface area of C 875	hich the area of the two visible d is 72 cm ² . V d faces of the D 36 vered by one f The volume of of the solid? D 900	of the shaded face i e unshaded faces. Vhat, in cm ² , is the cuboid? E 48 face of an identical the solid is 875 cm E 1050	n^3 .
The diagnone-quart The total area of or A 16 Q5 : 201 One cube cube, ma What, in A 750 Q6 : 201	ram shows a o ter of the area surface area ne of the visil B 28.8 .1_Q20 e has each of king a solid a cm ² , is the su B 800	cuboid in what of each of of the cuboid ble unshaded C 32 its faces cov as shown. Thurface area of C 875	hich the area of the two visible d is 72 cm ² . V d faces of the D 36 vered by one f The volume of of the solid? D 900	of the shaded face i e unshaded faces. Vhat, in cm ² , is the cuboid? E 48 Face of an identical the solid is 875 cm E 1050	s n ³ .
The diagnone-quart The total area of or A 16 Q5 : 201 One cube cube, ma What, in A 750 Q6 : 201 The diagnone cube	ram shows a of ter of the area surface area ne of the visil B 28.8 .1_Q20 e has each of king a solid a cm ² , is the su B 800 .2_Q6 rams on the ri be. Which lett	cuboid in what of each of of the cuboid ble unshaded C 32 its faces cov as shown. Thurface area of C 875	hich the area of the two visible d is 72 cm ² . V d faces of the of D 36 vered by one f The volume of of the solid? D 900 ree different v face opposite U	of the shaded face i e unshaded faces. Vhat, in cm ² , is the cuboid? E 48 Face of an identical the solid is 875 cm E 1050	n^{3}
The diagnone-quart The total area of or A 16 Q5 : 201 One cube cube, ma What, in A 750 Q6 : 201 The diagn same cub A I	ram shows a of ter of the area surface area ne of the visil B 28.8 .1_Q20 e has each of king a solid a cm ² , is the su B 800 .2_Q6 rams on the ri be. Which lett B P	cuboid in what of each of of the cuboid ble unshaded C 32 its faces cover as shown. The unface area of C 875 ight show the er is on the face C K	hich the area of the two visible d is 72 cm ² . V d faces of the of D 36 vered by one f The volume of of the solid? D 900 ree different v face opposite U D M	of the shaded face i e unshaded faces. Vhat, in cm ² , is the cuboid? E 48 Face of an identical the solid is 875 cm E 1050 iews of the J? E O	s a

Q7: 2013_Q10

On standard dice the total number of pips on each pair of opposite faces is 7. Two standard dice are placed in a stack, as shown, so that the total number of pips on the two touching faces is 5.

What is the total number of pips on the top and bottom faces of the stack?

	Α	5	B 6	C 7	D 8	E 9
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Q8: 2014_Q21

Pablo's teacher has given him 27 identical white cubes. She asks him to paint some of the faces of these cubes grey and then stack the cubes so that they appear as shown. What is the largest possible number of the individual white cubes which Pablo can leave with no faces painted grey?



A 8 B 12 C 14 D 15 E 16

Q9: 2014_Q25

A die has the shape of a regular tetrahedron, with the four faces having 1, 2, 3 and 4 pips. The die is placed with 4 pips 'face down' in one corner of the triangular grid shown, so that the face with 4 pips precisely covers the triangle marked with 4 pips. The



die is now 'rolled', by rotating about an edge without slipping, so that 1 pip is face down. It is rolled again, so that 2 pips are face down, as indicated. The rolling continues until the die rests on the shaded triangle in the opposite corner of the grid. How many pips are now face down?

A 1 B 2 C 3 D 4 E it depends on the route taken

Q10: 2015_Q20

The diagram shows a pyramid made up of 30 cubes, each measuring $1 \text{ m} \times 1 \text{ m} \times 1 \text{ m}$. What is the total surface area of the whole pyramid (including its base)?

A 30 m² B 62 m² C 72 m² D 152 m² E 180 m²

Q11 : 2016_Q10 A square is folded exactly in half and then in half again. Which of the following could not be the resulting shape? A B C D E E

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2 Angles

Q15: 2007_Q	16									
What is the sum of the six marked angles?										
A 1080°	B 1440°	C 1620°	D 1800	0°						
E more in	formation ne	eded		P.P.P						
Q16: 2007_Q9										
In the diagram What is the va	on the right, ST lue of x ?	is parallel to UV.	n	not to scale P x° 122°						
A 46 B	48 C 86	D 92	E 94	$U \longrightarrow 132^{-V}V$						
			<i>s</i> —	134° \rightarrow T						
				100 Berley						

Q17	: 200	08_Q19							
In the QS of x	he diag = SR ?	gram on the ri $P, \angle PQT = 2$	ght, $PT = QT$ 0° . What is the	= <i>TS</i> , value		Q 20°	x°		
А	20	B 2:	5 C	30					
D	35	E 40	0		P	T	S	R	

Q18: 2008_Q4

In this diagram, what is the value of x?									
A 16	B 36	C 64	D 100	E 144	<u>100°</u> 324°				

Q19: 2009_Q10 The diagram shows three squares of the same size. What is
the value of x?A 105B 120C 135D 150E 165

Q20: 2009_Q19 The diagram on the right shows a rhombus FGHI and G F an isosceles triangle FGJ in which GF = GJ. Angle $FJI = 111^{\circ}.$ What is the size of angle JFI ? 1112 J Not A 27° B 29° E $34\frac{1}{2}^{\circ}$ C 31° D 33° to scale HΙ

Q21 : 20	010_Q8					
In a trian What is t A 90	gle with ang he value of x B 80	les x° , y° , z° x? C 70	the mean of D 60	y and z is x. E 50	y° y°	not to scale z°
						ALC: NOT A

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	Junto	i widthemattee	at chattenge	rugeo o	155
Q27: 2013_Q3					
What is the value A 25 B 3	of x? 5 C 40	D 65	E 155	x° + 65°	
O28 : 2014 Q10					
An equilateral tria What is the value A 15 B 18	ngle is surrounded tof x ?3C24	by three squar D 30	res, as shown. E 36	x°	
Q29: 2015_Q16					
The diagram show What is the value	The square inside an of $x + y$?	equilateral t	riangle.		
A 105 B 120	C 135 D 150	E 165		x° y°	
Q30: 2015_Q25					
The four straight such that $VU = \angle VYZ$ and $\angle VZ$. Which of the foll terms of y and z?	lines in the diagra <i>VW</i> . The sizes of <i>X</i> are x° , y° and z° . owing equations g	m are $f \angle UXZ$, gives x in	z	z° y° x° Y X	
A $x = y - z$	В	x = 180 -	y-z	$C x = y - \frac{z}{2}$	
	D x = y + z -	- 90	E x	$x = \frac{5 - x}{2}$	
031 , 2015 06					
What is the value	of v in this triangle)			
A 45 B 50	C 55 D 60	E 65		x° 120°	
				1961.7	<u>197</u>

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Q32 : 2016_Q14 In the diagram, AB = AC and D is a point on AC such that BD = BC. Angle BAC is 40°. What is angle ABD? A 15° B 20° C 25° D 30° E 35° D = 35°

Q33: 2017_Q11

Seven squar outside the l	Seven squares are drawn on the sides of a heptagon so that they are outside the heptagon, as shown in the diagram.								
What is the									
A 315°	B 360°	C 420°	D 450°	E 630°					

Q34: 2017_Q19

What is the angle TVU ? A 45° B 42° C 39° D 36° E 33° $W = V = V = R$ X = P = Q	The diagra and an equ	m shows a reg ilateral triang	V T S			
A 45° B 42° C 39° D 36° E 33° $X \xrightarrow{P} Q$	What is the	e angle TVU		W		
	A 45°	B 42°	C 39°	D 36°	E 33°	$X \qquad P \qquad Q$

Q35: 2017_Q3

What is	the value	of x ?	303°		
A 43	B 47	C 53	D 57	E 67	

Q36: 2018_Q12



非淡泊无以明志,非宁静无以致远。



3 Averages



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