

ISMTF Middle School Competition – Toulouse June 2021

ROUND 3

The following are the 20 multiple choice questions for round 1 of the competition with the correct answers.

- Each question has options A,B,C,D and E
- Option E is always 'No Answer' and should be awarded '1' point
- The correct answer should be awarded '4' points
- An incorrect answer should be awarded '0' points

Question 1

Mathias is sick.

His mother prepares a full glass of water with 36 drops of medicine. Mathias drinks half of the glass, but refuses to drink the rest by saying that the taste is too bitter. His mother then tops up the glass with orange juice, stirs it and asks Mathias to drink the contents of the glass. Mathias again drinks half the glass, and then throws the rest down the sink. How many drops of the drug did he consume in total?

A	B	C	D	E
9	18	27	36	NO ANSWER

Question 2

There are four more girls than boys in Ms. Raub's class of 28 students.
What is the ratio of number of girls to the number of boys in her class?

A	B	C	D	E
3:4	4:3	2:3	3:2	NO ANSWER

Question 3

How many numbers between 19 and 79 are the product of two even numbers?

A	B	C	D	E
12	18	10	15	NO ANSWER

Question 4

The point totals that John scored in five basketball games were x , 11, 14, y , 12. How many different possible medians are there for his five point totals?

A	B	C	D	E
4	3	5	2	NO ANSWER

Question 5

The International School has 60 students in the 8th grade. 35 of the students own a musical instrument and 28 of them own a telescope. If 17 of them own both a musical instrument and a telescope, how many of them own neither musical instrument nor a telescope?

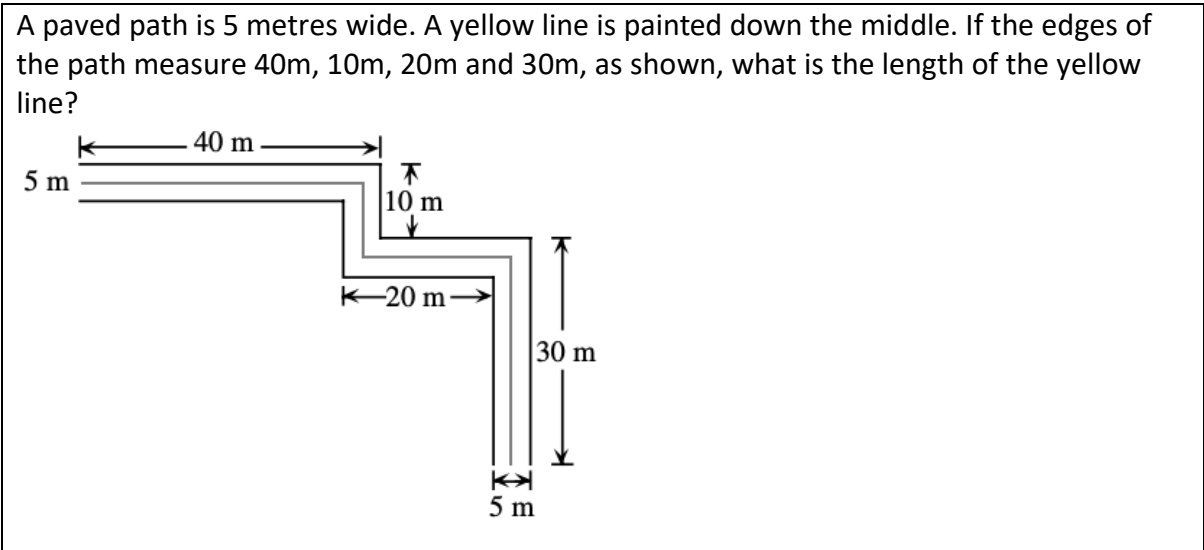
A	B	C	D	E
10	21	43	14	NO ANSWER

Question 6

A set of five different positive integers has an average (arithmetic mean) of 11. What is the largest possible number in this set?

A	B	C	D	E
35	40	45	46	NO ANSWER

Question 7



A	B	C	D	E
92.5m	95m	97.5m	100m	NO ANSWER

Question 8

If $3^A = 2$ and $3^B = 4$, find the value of 3^{3A+2B} .

A	B	C	D	E
128	48	24	14	NO ANSWER

Question 9

A certain fraction reduces to $\frac{5}{7}$ when in lowest terms. The sum of the numerator and denominator is 276. What is the numerator?

A	B	C	D	E
105	115	120	160	NO ANSWER

Question 10

In the 6 by 6 grid shown, two lines are drawn through point P , dividing the grid into three regions of equal area. These lines will pass through the points

The diagram shows a 6x6 grid. The top edge has points labeled Q, R, S, T, U from left to right. The right edge has points labeled H, J, K, L, M from top to bottom. The bottom-left corner is labeled P.

A	B	C	D	E
L and R	J and T	K and S	H and U	NO ANSWER

Question 11

Henry, Albert and Alison played a game. The probability of Henry winning is three times that of Albert winning. The probability of Albert winning is twice that of Alison winning. What is the probability of Henry winning?

A	B	C	D	E
$\frac{1}{9}$	$\frac{2}{3}$	$\frac{4}{9}$	$\frac{1}{3}$	NO ANSWER

Question 12

Seventy pupils (37 boys and 33 girls) are divided into 2 groups, with forty pupils in Group 1 and thirty pupils in Group 2. How many more boys are there in group 1 than there are girls in group 2?

A	B	C	D	E
4	7	8	9	NO ANSWER

Question 13

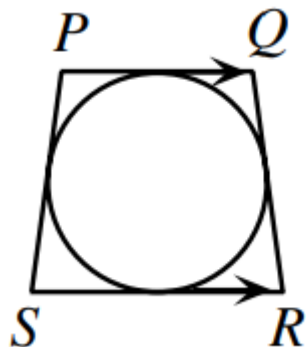
In her backyard garden, Gabriella has 12 tomato plants in a row. As she walks along the row, she notices that each plant in the row has one more tomato than the plant before. If she counts 186 tomatoes in total, how many tomatoes are there on the last plant in the row?

A	B	C	D	E
15	16	20	21	NO ANSWER

Question 14

A circle is inscribed in trapezoid PQRS.

If $PS = QR = 25$ cm, $PQ = 18$ cm and $SR = 32$ cm, what is the length of the diameter of the circle?



A	B	C	D	E
24	25	14	$\sqrt{429}$	NO ANSWER

Question 15

In 2020 Melissa's income tax was €2 290. Her income tax rate was 10% for the first €13 000 of her income and 15% for her income over €13 000. Which of the following best models x , Melissa's income in Euros

A	B	C	D	E
$(0.1+0.15)x - 13000=2290$	$(0.1)(13000) + 0.15(x-13000) =2290$	$0.15x - (0.1)(13000)=2290$	$(0.1)(13000)+0.15x =2290$	NO ANSWER

Question 16

The list of integers 4,4,x,y,13 has been arranged from least to greatest. How many different possible ordered pairs (x,y) are there so that the average (mean) of these 5 integers is itself an integer?

A	B	C	D	E
8	9	10	11	NO ANSWER

Question 17

Find the area of the lune (the yellow region), given $BO = 1$.

A	B	C	D	E
1	$\frac{1}{2}$	$\frac{\pi}{4}$	π	NO ANSWER

Question 18

Evaluate $\sqrt[4]{35 \times 125 \times 49 \times 27 \times 42 \times 8}$

A	B	C	D	E
190	210	225	250	NO ANSWER

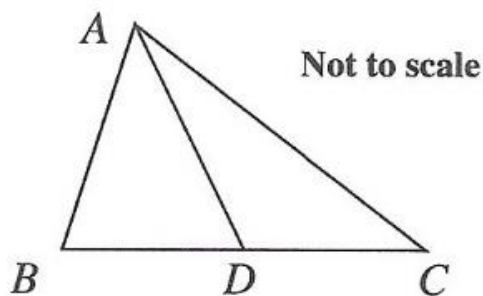
Question 19

It takes the older brother 10 minutes and the younger brother 12 minutes to go from home to school. If the younger brother leaves home 1 minute earlier, how long will it take the older brother to catch him up?

A	B	C	D	E
Answer 1 3	Answer 2 5	Answer 3 1	Answer 4 2	NO ANSWER

Question 20

In the triangle ABC, $AD=BD=CD$. What is the size of angle BAC?



A	B	C	D	E
60°	75°	90°	120°	NO ANSWER