International Online Math Challenge

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PAST PAPERS 2023

Category 2

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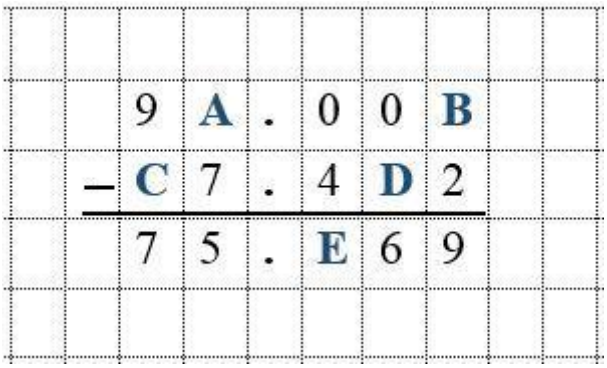
EXAM 2

1. If one year equals 365 days, how many seconds are there in a year?

A) 525600 B) 31536000 C) 8760 D) 1314000

2. Subtract decimals then find **A+B+C+D+E.**

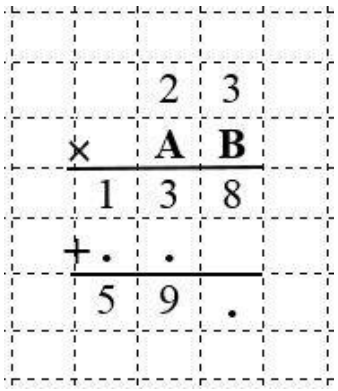


A) 13 B) 8 C) 12 D) 9

3. A car fuel tank contains 54.25 liters of fuel. The car uses 7.75 liters of fuel to travel 100 km. How far can the car travel with a full tank?

A) 700 km B) 800 km C) 600 km D) 900 km

4. Find the sum of the **A+B**.



A) 8 B) 10 C) 4 D) 2

5. Calculate.

$266 \div \left[22 - (10 + 22 \div 2) + 6 \times 22\right]$.

A) 134 B) 2 C) 6 D) 18

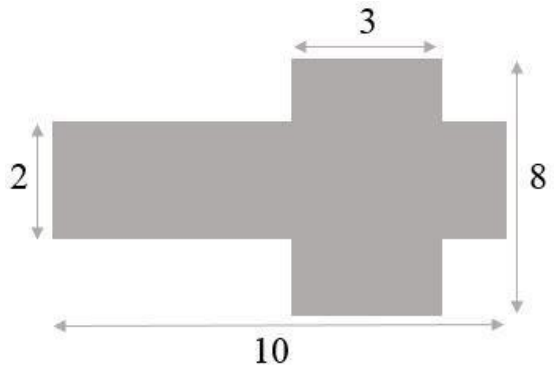
6. Calculate $1-2+3-4+5-6+\ldots+99-100$.

A) -100 B) 50 C) -50 D) 100

7. If a, b and c are positive integers such that the greatest common factor of b and c is 1 and $2.45 = a\frac{b}{c}$. Find the sum of $a+b+c$.

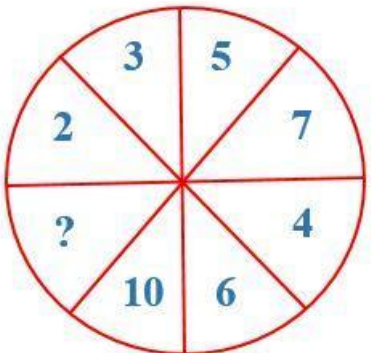
A) 31 B) 29 C) 145 D) 11

8. Find measure of the shaded area formed by the two intersecting perpendicular rectangles, in square units.



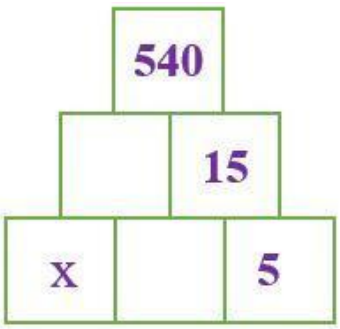
A) 74 B) 80 C) 38 D) 32

9. Find the missing number.



A) 13 B) 14 C) 12 D) 16

10. Here is multiplication pyramid. Find the x.



A) 2 B) 3 C) 18 D) 12

11. Calculate $9\div3\times(2+1)$.

A) 1 B) 9 C) 6 D) 3

12. Which of the following is correct?

A) $\frac{7}{9}<\frac{35}{43}<\frac{5}{6}$ **B)** $\frac{35}{43}<\frac{7}{9}<\frac{5}{6}$

C) $\frac{5}{6}<\frac{35}{43}<\frac{7}{9}$ **D)** $\frac{5}{6}<\frac{7}{9}<\frac{35}{43}$

13. Find the sum of the **A+B+C+D**.

		3	**A**	6	2	
			2	**B**	8	
	+ 7	**9**	8	**6**	**C**	
	D	4	1	0	5	

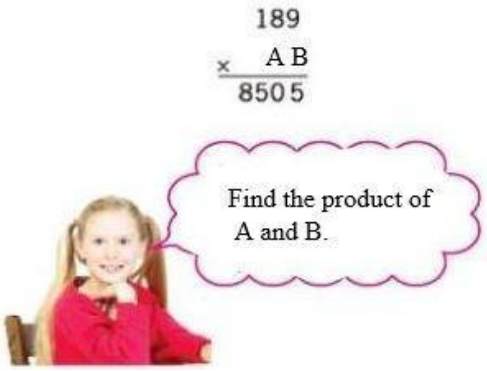
A) 15 B) 16 C) 29 D) 13

14. If $a < b$, which of the followings must be true?

I. $b^2 > a^2$
II. $3a < 3b$
III. $-b < -a$

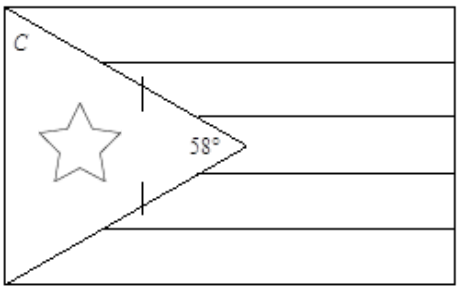
A) I only
B) I and II only
C) I and III only
D) II and III only
E) I, II and III

15. Work out.



A) 25 B) 35 C) 10 D) 20

16. A drawing of the flag of Puerto Rico is shown below. Assume that the triangle in the flag is isosceles, as shown. What is the measure, in degrees, of angle *C* in the triangle?



A) 122^0 B) 61^0 C) 58^0 D) 116^0

17. Find the next number in the pattern 4, 5, 8, 17, 44, ...

A) 80 B) 125 C) 112 D) 60

18. Which one is the same as 324÷54?

A) 806÷134 B) 2×2×2 C) 56÷2 D) (918 – 114)÷134

19. Look at this series: U32, V29, … , X23, Y20
Find the missing term.

A) W26 B) W17 C) Z17 D) Z26

20. If

$a-b=4$
$b-6=c$
$c-2=d$
$a+d=4$

Then, find the value of a .

A) 4 B) 8 C) 16

D) It can't be determined from the information given.

21. 31st December 1997 was a Wednesday. How many Wednesdays were there in 1997?

A) 12 B) 51 C) 52 D) 53

22. The arithmetic mean of 1, a and b is equal to $2c$. The arithmetic mean of 1, a and c is equal to $2b$. The arithmetic mean of 1, b and c is equal to $2a$. Find the arithmetic mean of a, b and c.

A) $\frac{2}{3}$ B) $\frac{1}{4}$ C) $\frac{1}{2}$ D) $\frac{1}{3}$

23.

The tick marks on the number line above are equally spaced. If 2 is halfway between b and c, and the value of $c - a$ is 10, what is the value of b?

A) –4 B) –2 C) 0 D) 4

24. The table below shows the results of a random survey of 500 men and women. Each individual chose a flavor of ice cream that was his or her favorite. Approximately what percent of the men chose mint chip as their favorite ice cream flavor?

Favorite Ice Cream Flavors

	Men	Women	Total
Chocolate	74	63	137
Vanilla	68	22	90
Strawberry	17	39	56
Cookie Dough	51	87	138
Mint Chip	65	14	79
Total	275	225	500

A) 24% B) 26% C) 28% D) 30%

25. A car travels from point A to B in 3 hours and returns back to point A in 5 hours. Points A and B are 150 km apart along a straight highway. What is the average speed of the car during the trip?

A) 43 km/h B) 45 km/h C) 40.7 km/h D) 37.5 km/h

26. A toy store offers a 40% discount on all items. If a toy originally costs $50, what will be the discounted price?

A) $30 B) $40 C) $20 D) $10

27. The sum of two consecutive even numbers is 98. What are those numbers?

A) 48 and 50 B) 52 and 50 C) 54 and 52 D) 56 and 54

28. Elsa spends 30% of her salary on rent, 20% on groceries and 25% on entertainment. If her remaining salary is $500, what is her salary?

A) $2000 B) $3000 C) $4000 D) $5000

29. A box contains red, yellow and green apples with ratio 3:2:5. If there are 1000 apples in total, how many of them are red?

A) 300 B) 400 C) 500 D) 600

30. A 3×4×5 solid block is made up of 1×1×1 unit cubes. The outside surface of the block is painted black. How many unit cubes have exactly one face painted black?

A) 16 B) 18 C) 20 D) 22

31. If a and b are positive integers such that $a+\frac{1}{b}=2.5$, then what would be the decimal result of $\frac{b}{ab+1}$?

A) 0.4 B) 0.5 C) 0.25 D) 1.25

32. Simplify $\frac{1}{2}-\left(\frac{1}{2}-\frac{1}{3}\right)-\left(\frac{1}{2}+\frac{1}{3}-\frac{1}{6}\right)$.

A) $-\frac{1}{3}$ B) $-\frac{1}{4}$ C) $-\frac{1}{6}$ D) $\frac{1}{2}$

33. Solve $0.36x-0.9=0.12x+0.3$

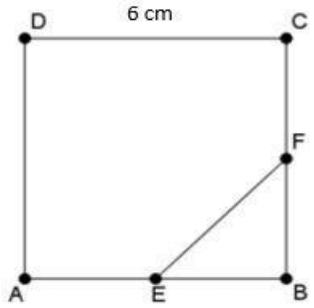
A) 4 B) 0.2 C) 0.5 D) 5

34. What is the measure of the smaller angle made by the minute hand and hour hand of the clock at 10 past 3?

A) 30° B) 32°

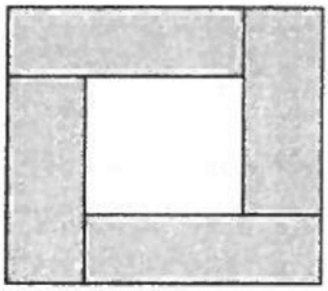
C) 34° D) 35°

35. In the square with the side lengths of 6cm below, E and F are the midpoints of the sides. What is the value of the square of the length EF? ($|EF|^2$ =?)



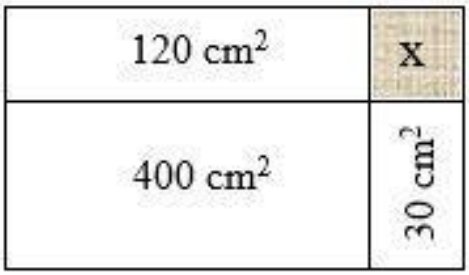
A) 18 B) 36 C) 8 D) 25

36. The diagram shows 4 identical rectangles and an outer and an inner square.
If the perimeter of each rectangle is 40 cm, the area of inner square is 16 cm^2, what is the area of each of the rectangles in cm^2 ?



A) 100 B) 99 C) 96 D) 91

37. Find the shaded area of the rectangle below?



A) 6 cm^2 B) 9 cm^2 C) 10 cm^2 D) 12 cm^2

38. Calculate 444+4044+4404+4440.

A) 13332 B) 12222 C) 12332 D) 13222

39. What letter is in the 100th position in the pattern below?

I M C O I M C O I M C O . . .

A) I B) M C) C D) O

40. Kevin found a cubic box with an open top. Each side is 8 cm long. If he fills this box with identical cubes with $2cm \times 2cm \times 2cm$, how many of these cubes will be touching the box?

A) 40 B) 48 C) 52 D) 56