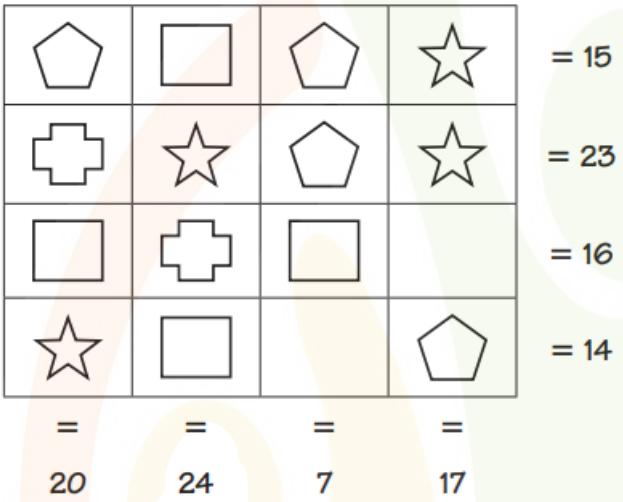
Brainiacs Math Olympiad Preliminary Round Sample Exam Paper 2

Category III – gradeS 7 and 8

Q1.

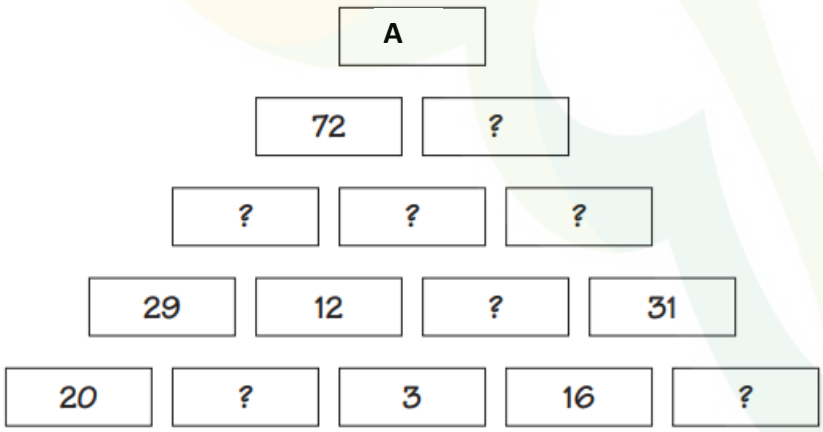
The grid below has symbols that contain a whole number value less than 10. Each symbol has its own value. The numbers you see at the end of each row and column are the sums of the figures' values for that row or column. Find out the value of square?



A. 1
B. 5
C. 6
D. 8

Q2.

Below is a number pyramid where the numbers are arranged in a logical fashion so you can replace each question mark with a correct whole number. Determine what that logic is and find the value of A.



A. 153
B. 112
C.174
D.162

Q3.

A survey showed that of 100 high school students, 50 of them took biology, 20 took chemistry, and 12 took both. How many of the 100 students took neither biology nor chemistry?

A. 18
B. 58
C. 42
D. 182

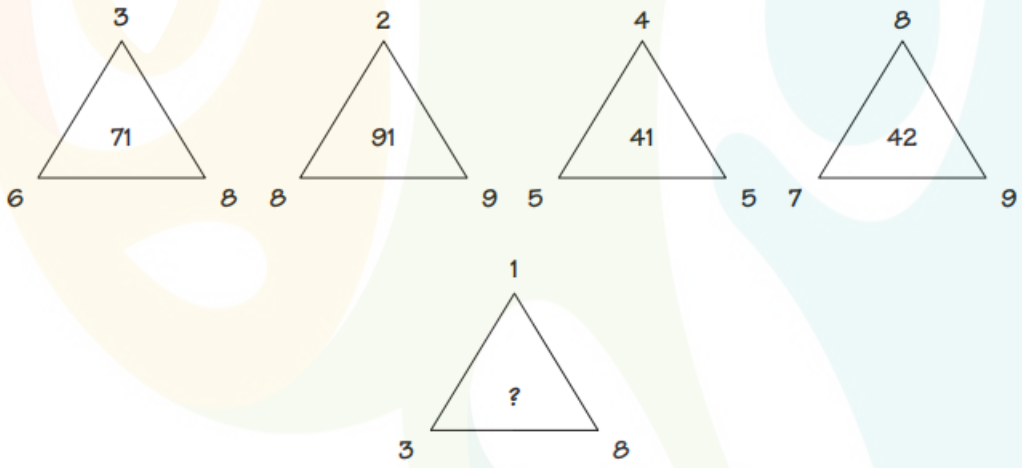
Q4.

In a bass fishing tournament, 200 bass were caught in 5 days. The total fish caught on each day was 8 more than the day before. How many fish were caught on the first day?

A.40
B.32
C.24
D.16

Q5.

What is the missing number?



A. 31
B. 21
C. 24
D. 32

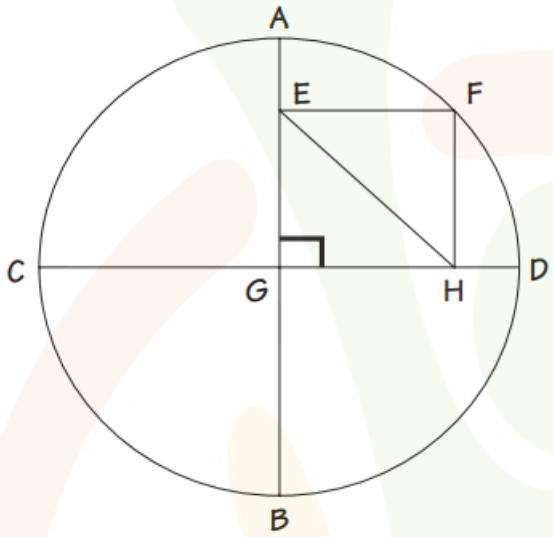
Q6.

Jane bought a $40 pair of jeans and received a 20% discount, and then bought a $30 shirt and received a 40% discount when she checked out. What is the single percent discount for the total purchase?

A.24.8
B.26.4%
C.28.6%
D.28.4%

Q7.

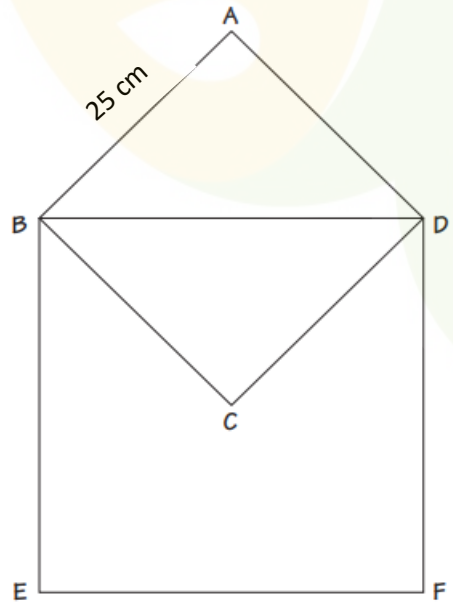
Rectangle EFHG is inscribed in the circle below. Line AE represents 5 cm. Line EG represents 7 cm. What is the length of Line EH?



A. 6
B. 12
C. $7\sqrt{2}$
D. 14

Q8.

In the figure below, ABCD is a square where AB is equal to 25 cm.
What is the area of square BDFE in cm^2?



A. 225
B. 625
C. 1250
D. 2500

Q9.

The sum of three numbers is 76. The second number is twice the first and six less than the third. Find the smallest number.

A. 12

B. 14

C. 16

D. 19

Q10.

Lets say $y = \frac{1}{1+\frac{y}{x}}$ and $z = \frac{1}{1+\frac{z}{y}}$. If z = 2 then find x.

A. 1

B. 2

C. $\frac{3}{4}$

D. $\frac{4}{3}$

Q11.

Solve the equation.

$$\frac{12}{6-\frac{4}{1+\frac{6}{5+\frac{3}{x+1}}}} = 3$$

A. 1

B. 2

C. $\frac{2}{5}$

D. $\frac{1}{2}$

Q12.

The sum of half a number and one-third of another number is 22. The difference of half of the second number and one sixth of the first number is 11. Find the value of smallest number.

A.24

B. 28

C. 30

D.32

Q13.

The sum of the digits of a two-digit numbers 12. If the digits are reversed, the new number is 36 less than the original number. Find the number.

A. 42
B. 58
C. 68
D. 84

Q14.

Solve system of equation.

$$\begin{cases} \frac{2x-3y-10}{x} = -2 \\ \frac{-6y+3y+6}{y} = 2 \end{cases}$$

A. $(\frac{2}{3};\frac{-5}{3})$
B. $(\frac{4}{7};\frac{-18}{7})$
C. $(\frac{5}{9};\frac{-8}{9})$
D. $(\frac{1}{4};\frac{-3}{4})$

Q15.

A mother has three children. The middle child is two years older than the youngest child, and the oldest child is two years older than the middle child. The mother's age now is twice the sum of the ages of her children. If the mother is 30 years old now, find her age when her oldest child was born.

A. 33
B. 27
C. 25
D. 23

Q16.

Jack can wash the family car in 45 minutes. John can wash it in 30 minutes. How long will it take them to wash the car if they work together?

A. 90 minutes
B. 37.5 minutes
C. 24 minutes
D. 18 minutes

Q17.

A father and his son are respectively 32 and 8 years old.
In how many years will their ages be in the ratio $5:2$.
A. 4
B. 6
C. 8
D. 12

Q18.

Ten workers can build five houses in 30 days.
How long will it take 15 workers to build ten houses?
A.45
B.40
C.35
D.33

Q19.

How many different three – digit odd numbers can be formed using the digits in the set $\{4, 5, 6, 7, 8, 9\}$?

A. 108
B. 84
C. 60
D.54

Q20.

Annabel, Ben, James, and David are in an amusement park and they want to take a roller-coaster ride. The roller-coaster car has four seats in a row. James is Annabel's younger brother and must always sit next to Annabel. In how many ways can the four people sit in the car?

A. 3
B. 6
C. 12
D. 16