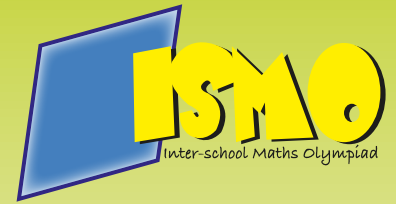




PAKTURK
INTERNATIONAL SCHOOLS & COLLEGES



10th NATIONAL INTER-SCHOOL MATHS OLYMPIAD

EXAM BOOKLET FOR CLASS 8

Official Partner



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10th NATIONAL INTER-SCHOOL MATHS OLYMPIAD

INSTRUCTIONS

1. The total time for the Olympiad is 90 minutes. There is no negative marking.
2. There are 50 questions. (Calculator is **not** allowed.)
3. Do not forget to write your name, class and gender on your answer sheet.
4. There is only one correct answer for each question out of given 4 options A, B, C, D. If you mark more than one choice the answer will be considered wrong. Mark your answers on answer sheet; marks on the booklet will not be accepted.
5. Answer sheets will be checked by using the optical reader. Do not fold or use your answer sheet for calculation etc.
6. Before you begin to answer the questions, read them carefully.
7. You may begin your answer from any question; however you must make sure that the number of the question you are answering matches the correct number in the answer sheet.
8. Mark your answer with a lead pencil by filling only the inside of the circles. Do not write or put any other mark on your answer sheet.
9. Speed is important when you answer the questions. If you have difficulty with a question, do not waste your time to solve it, just move on to the next question, You may go back to the 'difficult' question if you still have time after finishing other parts of the Olympiad.
10. The blank pages in the booklet may be used for writing and calculations.
11. Answer key will be uploaded on our website at 7:00 p.m. on 24th November 2014.
12. Results will be announced through our website (www.ismo.pk) on 8th December 2014.

Q1: Which of the following numbers is the smallest one?

- A) $\frac{36}{21}$ B) $\frac{29}{14}$ C) $\frac{21}{9}$ D) $\frac{19}{4}$

Q2: $\frac{2a}{3b} \times \frac{9b}{8a} = ?$

- A) $\frac{18}{12}$ B) $\frac{3a}{4b}$ C) $\frac{3}{4}$ D) $\frac{4b}{3a}$

Q3: $\sqrt{20 + \frac{1}{4}} = ?$

- A) 3 B) 4.5 C) 5 D) 6

Q4: If $7\frac{5}{6} + a = 8\frac{1}{3}$, then what is the value of a ?

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

Q5: If x is a negative integer, which of the following is the biggest?

- A) $-2x$ B) $2x$ C) $6x + 2$ D) $x - 2$

Q6: $\sqrt{20 + \sqrt{3^2 + 16}} = ?$

- A) 3 B) 4 C) 5 D) 11

Q7: If $\frac{a}{7} = \frac{b}{9}$ then, what is the value of $9a - 7b$?

- A) 2 B) 63 C) -63 D) 0

Q8: $\frac{0.001}{0.01} + \frac{0.2}{0.05} + \frac{0.09}{0.1} = ?$

- A) 3 B) 4 C) 5 D) 11

Q9: What is the average (arithmetic mean) of the 3 quantities $12 - n$, 12 and $12 + n$?

- A) 4 B) 12 C) 18 D) $4 + \frac{n}{3}$

Q10: $A = \frac{1}{6} + \frac{1}{3} + \frac{1}{2}$ and $B = \frac{1}{8} + \frac{1}{4} + \frac{1}{2}$, then $A + B = ?$

- A) $\frac{2}{3}$ B) 1 C) $\frac{11}{8}$ D) $\frac{15}{8}$

Q11: If $b^3 = -64$, then $b^2 - 2b + 64$ is:

- A) 88 B) -44 C) 0 D) -88

Q12: $\left(\frac{30 + 8 \div 4}{30 - 4 \times 2}\right) \div \left(\frac{15 \times 4 + 8 \div 2}{21 + 5 \div 5}\right) = ?$

- A) $\frac{1}{22}$ B) $\frac{1}{5}$ C) 2 D) $\frac{1}{2}$

Q13: $\frac{(0.8)^2 - (0.3)^2}{(0.6)^2 - (0.5)^2} = ?$

- A) 1 B) 2 C) 4 D) 5

Q14: How many of the following numbers are even numbers?

- I. $8^8 - 11^6$
 II. $12^7 - 9^0$
 III. $5^{12} \times 4^9 - 6^9$
 IV. $(5^7 - 3)^5 + 2$
 V. $2013^2 - 2012^2$

- A) 1 B) 2 C) 3 D) 4

Q15: If $A = (-1)^2 + 1^2 + [(18 \div 3) \div 2] - 8 + 4$
 Which of the following is equal to A ?

- A) $4^2 \times 0 \times (-2)^4$ B) $2^3 - (5 + 2)$
 C) $4^0 + 1$ D) $12 + 3$

Q16: If $6x + 3y = 60$ and $\frac{3x}{4y} = \frac{6}{16}$, what is the value of $x + y$?

- A) 17 B) 15 C) 10 D) 7

Q17: What is the total number of proper and improper subsets of set $A = \{k, l, m, n, r, o\}$?

- A) 63 B) 1 C) 64 D) 65

Q18: a, b and c are natural numbers.

$$5a = 7b$$

$$6a = 4c$$

Which of the following orders is correct?

- A) $a > b > c$ B) $a > c > b$
 C) $b > a > c$ D) $c > a > b$

Q19: How many subsets of $A = \{I, S, M, O\}$ have only two elements?

- A) 4 B) 5 C) 6 D) 7

Q20: $\sqrt{0.04 + \sqrt{0.06 + \sqrt{0.09}}} \times \sqrt{0.66 - \sqrt{0.09}} = ?$

- A) 0.36 B) 0.064 C) 0.48 D) 4.8

Q21: Simplify $\frac{\sqrt{1.44} - \sqrt{0.04}}{\sqrt{0.09} + \sqrt{0.04}}$.

- A) 1 B) 2 C) 0.1 D) 0.2

Q22: The sum of 20% and 25% of a number is 540. What is the number?

- A) 900 B) 1100 C) 1200 D) 1800

Q23: To find 10 percent of a number is same as dividing the same number by _____:

- A) 100 B) 0.1 C) 10 D) 5

Q24: Which of the following is false?

- A) $\sqrt{1} + \sqrt{4} + \sqrt{16} = 7$ B) $\sqrt{\sqrt{\sqrt{256}}} = 2$
 C) $\sqrt{\frac{144}{9}} = 4$ D) $\sqrt{0.4} \times \sqrt{0.9} = 0.06$

Q25: The set $A = \{a, b, c, 1, \{a\}, 2\}$ is given.

Which of the following is false?

- A) $n(A) = 6$ B) $\{a\} \subset A$
 C) $a \in A$ D) $a \subset A$

Q26: What is the value of "a" if the value of x in the equation $2(x - 3) + 4(2x + 1) = 18$ satisfies the

equation $\frac{2x - a}{3} - \frac{3x + a}{5} = \frac{1}{3}$

- A) $-\frac{3}{8}$ B) $\frac{3}{8}$ C) $-\frac{1}{8}$ D) $\frac{1}{8}$

Q27: In a city, 75 % of people use tablet and 55 % of people use mobile.

At least what percent of people use both tablet and mobile?

- A) 30 % B) 25 % C) 20 % D) 15 %

Q28: If 30% of m is equal to 75% of n , what is the 50% of m if $n = 84$?

- A) 110 B) 120 C) 105 D) 115

Q29: What percent of the numbers from 1 to 100 are divisible by 4?

- A) 20% B) 25% C) 24% D) 40%

Q30: $\sqrt{\frac{144}{9}} - \sqrt{\frac{9}{81}} + \sqrt{\frac{3}{27}} = ?$

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

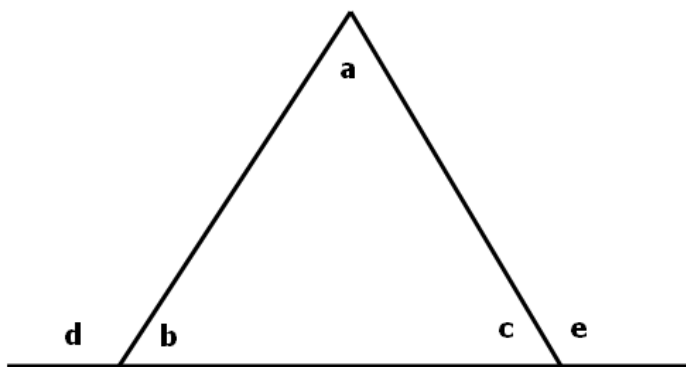
Q31: The numbers which are equal to sum of square and square root of itself are known as awesome numbers.

Example: $4^2 + \sqrt{4} = 16 + 2 = 18$

Which of the following numbers is also awesome number?

- A) 84 B) 120 C) 196 D) 424

Q32: According to the below diagram, which of the following is false?



- A) $a + b = e$ B) $a + c = d$
 C) $a + b + c = 180^\circ$ D) $d + e = 180^\circ$

Q33: What is the average of the squares and the cubes of first 3 prime numbers?

- A) 27 B) 33 C) 35 D) 41

Q34: One pipe can fill a tank three times as fast as another pipe. If together the two pipes can fill the tank in 36 minutes, then the slower pipe alone will be able to fill the tank in:

- A) 81 min B) 108 min
 C) 144 min D) 192 min

Q35: It takes six people eight hours to stuff 10,000 envelopes.

How many people would be required to do the job in three hours?

- A) 4 B) 12 C) 16 D) 18

Q36: What is the tenth term of the pattern below?

$\frac{10}{1024}, \frac{9}{512}, \frac{8}{256}, \frac{7}{128}, \dots$

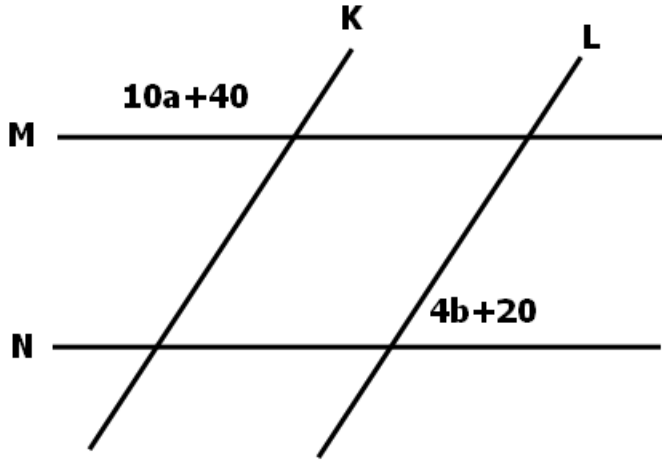
- A) $\frac{1}{2}$ B) $\frac{1}{4}$ C) $\frac{3}{4}$ D) $\frac{3}{8}$

Q37: Iqra is 10 years old. Her mother Asma is 4 times as old as Iqra.

How old will Asma be when Iqra is twice as old as she is now?

- A) 80 years B) 70 years
 C) 60 years D) 50 years

Q38: In the diagram below, lines K and L are parallel, and lines M and N are parallel.



What is the value of "a" if b=10?

- A) 4 B) 8 C) 10 D) 12

Q39: The shadow of a tree which is 300 cm long is 240 cm long while the shadow of Yasir is 144 cm long.

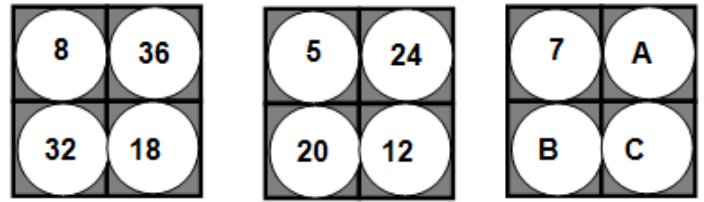
How tall is Yasir in centimeters?

- A) 180 B) 184 C) 175 D) 190

Q40: There are two sections A and B of a class, consisting of 36 and 44 students respectively. If the average weight of section A is 40kg and that of section B is 35kg, find the average weight of the whole class.

- A) 35.25 B) 36 C) 37.25 D) 38

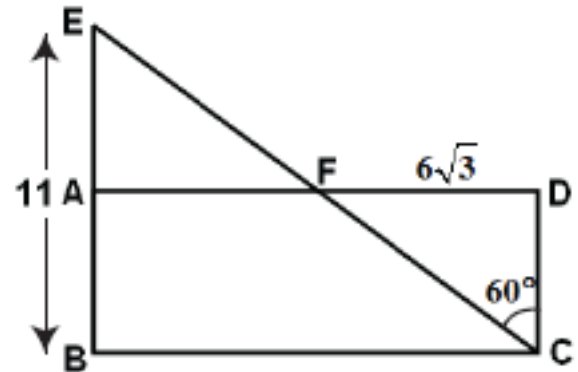
Q41: The numbers are arranged according to a rule.



What is A+B+C?

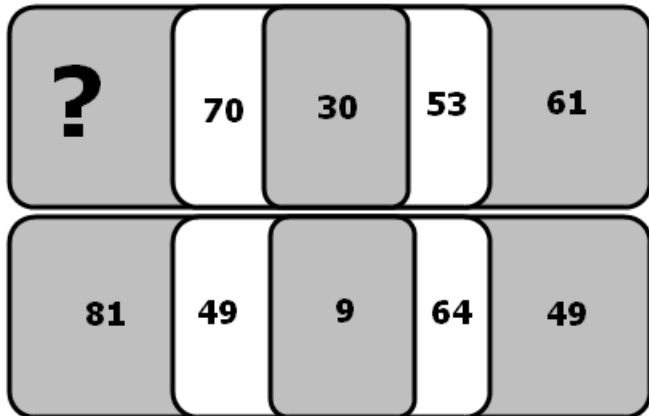
- A) 76 B) 84 C) 92 D) 98

Q42: In the diagram below, ABCD is a rectangle. Line FD is $6\sqrt{3}$ units long, line EB is eleven units long, and the measure of angle ECD is 60° . What is the length of line EF?



- A) $10\sqrt{3}$ B) 10 C) $5\sqrt{3}$ D) 5

Q43: What is the number indicated by question mark?



- A) 44 B) 55 C) 80 D) 18

Q44:

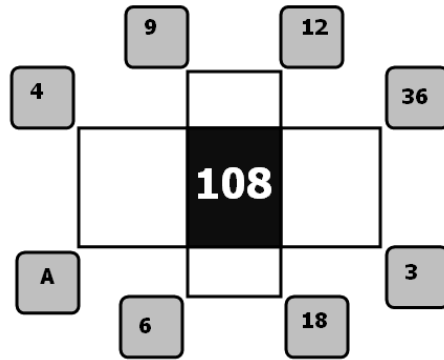
$$A = \frac{4}{3} + \frac{7}{5} + \frac{10}{7}$$

$$B = \frac{1}{3} + \frac{2}{5} + \frac{3}{7}$$

Which of the following is correct?

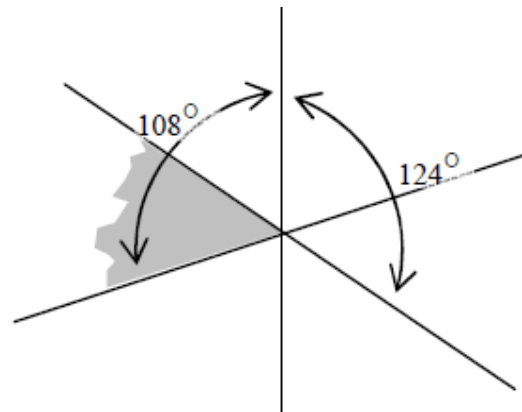
- A) $A - B = 3$ B) $A + B = \frac{121}{105}$
 C) $A = \frac{7}{3}$ D) $B = \frac{1}{4}$

Q45: Which number will come instead of A?



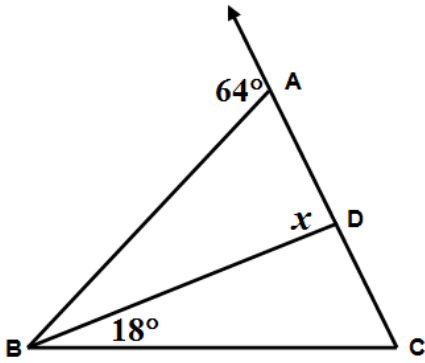
- A) 45 B) 27 C) 15 D) 5

Q46: Three lines intersect at one point. Two angles are given in the figure. How many degrees is the grey angle?



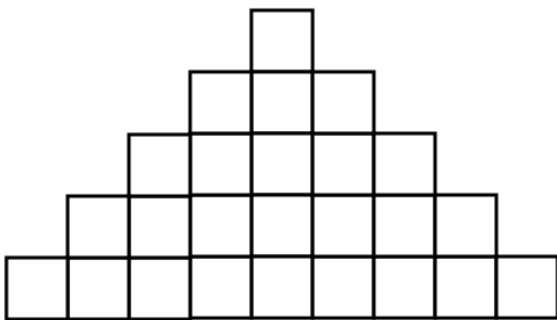
- A) 52° B) 54° C) 56° D) 58°

Q47: In the triangle ABC, what is the value of x if $AB = AC$?



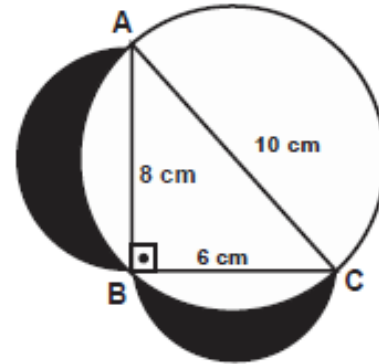
- A) 42° B) 46° C) 48° D) 50°

Q48: How many squares are there in the figure below?



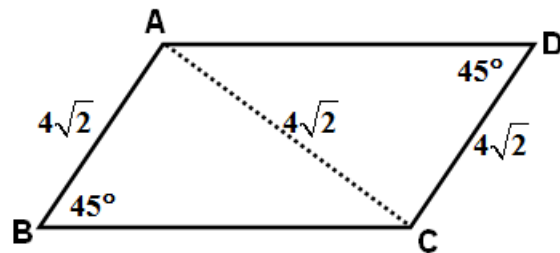
- A) 25 B) 30 C) 41 D) 45

Q49: Find the area of shaded region if the line segments AC, AB and BC are the diameters of the circles.



- A) $\left(12 - \frac{25\pi}{2}\right) \text{cm}^2$ B) 24cm^2
 C) $(24 - 25\pi) \text{cm}^2$ D) $\frac{25\pi}{2} \text{cm}^2$

Q50: In the below figure, lengths AB, AC, and CD are all $4\sqrt{2}$ units. Angles B and D are both 45° . What is the perimeter and area of ABCD?



- A) Area : $8\sqrt{2}$ B) Area : 8
 Perimeter : $16 + 8\sqrt{2}$ C) Perimeter : $8 + 8\sqrt{2}$
 C) Area : 16 D) Area : 32
 Perimeter : $8 + 8\sqrt{2}$ D) Perimeter : $16 + 8\sqrt{2}$