EHF™
LEARNING FOR LIFE

EDUHEAL FOUNDATION

CLASS 9

LEVEL – 1

Set A1

EHF OLYMPIADS

• 4000 schools • 6 lakh students
• 11 olympiads • Global reach

NIMO™

EHF
NATIONAL INTERACTIVE
MATHS OLYMPIAD™

Name : .....

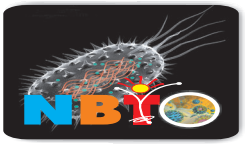
Roll No : .....

Class : .....

School : .....

art and Sports clinic contest

NATIONAL BIOTECHNOLOGY OLYMPIAD



NATIONAL INTERACTIVE MATHS OLYMPIAD

NATIONAL INTERACTIVE SCIENCE OLYMPIAD

INTERNATIONAL CYBER OLYMPIAD

INTERNATIONAL ENGLISH OLYMPIAD

INTERNATIONAL GENERAL KNOWLEDGE OLYMPIAD

Sponsored By: BSE INVESTORS' PROTECTION FUND

Business & international finance olympiad (BIFO)

NATIONAL IIT-NEET OLYMPIAD (NINO)

Level - 1 : All Level-1 successful* participants will get certificate, apititude report and school toppers will be eligible for school hero medals.

Level - 2 : School toppers* will be selected for level-2-National level - online computer based interactive test held at exam centres all over India. Winner will get merit certificate, medals, laptop, scholarship and other prizes.

Level - 3 Senior Class Toppers will qualify# for level-3-International level- where you will compete with students globally. Get selected for MIT-Harvard Maths Tournament (Online). Represent India & win laurels. Guidance by top scientists. HMMT

* # See prospectus/website for details

WEBSITE : WWW.EDUHEALFOUNDATION.ORG
E-MAIL : INFO@EDUHEALFOUNDATION.ORG

ROUGH WORK

Instructions for the Candidate

1. You are allowed additional 10 minutes to fill the required details in the RESPONSE SHEET (OMR).
2. The question paper is made as per syllabus guidelines & pattern given in the information Booklet. The Question Paper for Classes 1 to 6 contains 40 Questions each to be answered in 60 minutes. The Question paper for classes 7 to 12 contains 60 Questions each to be answered in 60 minutes. All questions are compulsory. Further instructions are given in the instruction letter to the teacher.
3. Use the response sheet to mark your responses by darkening the required circle. The response sheet has to be returned to the foundation, duly filled in. THE STUDENT CAN RETAIN THE QUESTION PAPER.

MENTAL ABILITY

1. 'Soldier' is related to 'Army' in the same way as 'Pupil' is related to …….

(1) Education

(2) Teacher

(3) Student

(4) Class

2. The least number ,which when divided by 12, 15, 20 or 54 leaves a remainder of 4 in each case,is

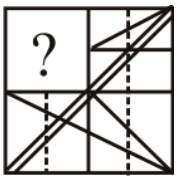
(1) 450

(2) 454

(3) 54

(4) 544

3.



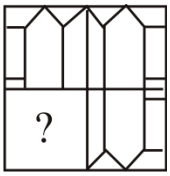
(1) 

(2) 

(3) 

(4) 

4.



(1) 

(2) 

(3) 

(4) 

5. Sanjay walks 7 km towards north and turns towards left and covers 3 km. Again he turns towards left and walks 11 km. How far is he from the starting point?

(1) 16 km (2) 21 km

(3) 12 km (4) 5 km

Directions:

(i) Five friends, A, B, C, D and E, are sitting on a bench in a park.

(ii) A is sitting next to B.

(iii) C is sitting next to D.

(iv) D is not sitting with E.

(v) A is to the right of B and E.

(vi) E is at the left end of the bench.

(vii) C is at the second position from the right.

(viii) A and C are sitting together.

6. Where is A sitting?

(1) Between B and D

(2) Between D and C

(3) Between C and E

(4) Between B and C

7. Who are sitting on either side of C?

(1) A and E (2) A and D

(3) B and D (4) D and E

8. What is the position of B?

(1) Extreme left (2) Centre

(3) Second from left (4) Second from right

9. Who is sitting at the centre?

(1) B (2) D

(3) C (4) A

10. What is the position of D?

(1) Extreme right

(2) Second from left

(3) Third from left

(4) Extreme left

11. One angle is equal to three times its supplement. The measure of the angle is

(1) 130º (2) 135º

(3) 90º (4) 120º

12. Two straight lines AB and CD intersect one another at the point O. If

$\angle AOC + \angle COB + \angle BOD = 274º$, then $\angle AOD =$

(1) 86º (2) 90º

(3) 94º (4) 137º

13. Two straight lines AB and CD cut each other at O. If $\angle BOD = 63º$, then $\angle BOC =$

(1) 63º (2) 117º

(3) 17º (4) 153º

14. Given $\angle POR = 3x$ and $\angle QOR = 2x + 10º$. If POQ is a straight line then the value of x is

(1) 30º (2) 34º

(3) 36º (4) none of these

15. The sides of a triangle are 16 cm, 30 cm, 34 cm. Its area is

(1) 225 cm^2 (2) 240 cm^2

(3) $225\sqrt{2}$ cm^2 (4) 450 cm^2

16. The base of an isosceles right triangle is 30 cm. Its area is

(1) 225 cm^2 (2) $225\sqrt{3}$ cm^2

(3) $225\sqrt{2}$ cm^2 (4) 450 cm^2

17. The sides of a triangle are 7 cm, 9 cm and 14 cm. Its area is

(1) $12\sqrt{5}$ cm^2

(2) $12\sqrt{3}$ cm^2

(3) $24\sqrt{5}$ cm^2

(4) 63 cm^2

18. The sides of a triangular field are 325 m, 300 m, and 125 m. Its area is

(1) 18750 m^2 (2) 37500 m^2

(3) 97500 m^2 (4) 48750 m^2

19. The sides of a triangle are 50cm, 78cm and 112cm. The smallest altitude is

(1) 20 cm (2) 30 cm

(3) 40 cm (4) 50 cm

20. The sides of a triangle are 11 cm, 15 cm and 16 cm. The altitude to the largest side is

(1) $30\sqrt{7}$ cm (2) $\frac{15\sqrt{7}}{2}$ cm

(3) $\frac{15\sqrt{7}}{4}$ cm (4) 30 cm

21. If the area of an isosceles right triangle is 8 cm^2, what is the perimeter of the triangle?

(1) $8+\sqrt{2}$ cm

(2) $8+4\sqrt{2}$ cm

(3) $4+8\sqrt{2}$ cm

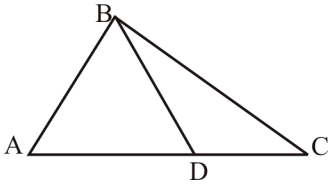
(4) $12\sqrt{2}$ cm

22. The lengths of the sides of ΔABC are consecutive integers. If ΔABC has the same perimeter as an equilateral triangle with a side of length 9 cm, what is the length of the shortest side of ΔABC?

(1) 4 (2) 6

(3) 8 (4) 10

23. In figure the ratio of AD to DC is 3 to 2. If the area of ΔABC is 40 cm^2, what is the area of ΔBDC?



(1) 16 cm^2 (2) 24 cm^2

(3) 30 cm^2 (4) 36 cm^2

24. The base and hypotenuse of a right triangle are respectively 5 cm and 13 cm long. Its area is

(1) 25 cm^2 (2) 28 cm^2

(3) 30 cm^2 (4) 40 cm^2

25. The number 0.318564318564318564 ..... is

(1) a natural number (2) an integer

(3) a rational number (4) an irrational number

26. If n is a natural number, then $\sqrt{n}$ is

(1) always a natural number

(2) always an irrational number

(3) always an rational number

(4) sometimes a natural number and sometimes an irrational number

27. Which of the following numbers can be represented as non-terminating, repeating decimals?

(1) $\frac{39}{24}$ (2) $\frac{3}{16}$

(3) $\frac{3}{11}$ (4) $\frac{137}{25}$

28. Every point on a number line represents

(1) a unique real number

(2) a natural number

(3) a rational number

(4) an irrational number

29. An irrational number between 2 and 2.5 is

(1) $\sqrt{11}$ (2) $\sqrt{5}$

(3) $\sqrt{22.5}$ (4) $\sqrt{12.5}$

30. Which of the following is irrational?

(1) 0.15

(2) 0.01516

(3) $0.\overline{1516}$

(4) 0.5015001500015....

31. The number $1.\overline{27}$ in the form p/q, where p and q are integers and $q \neq 0$, is

(1) 14/9 (2) 14/11

(3) 14/13 (4) 14/15

32. Which of the following is rational?

(1) $\sqrt{3}$ (2) π

(3) $\frac{4}{0}$ (4) $\frac{0}{4}$

33. The number of consecutive zeros in $2^3 \times 5^4 \times 7$, is

(1) 1 (2) 2

(3) 3 (4) 4

34. The number $0.\overline{3}$ in the form p/q, where p and q are integers and $q \neq 0$, is

(1) 33/100 (2) 3/10

(3) 1/3 (4) 3/100

35. The smallest rational number by which 1/3 should be multiplied so that its decimal expansion terminates after one placed of decimal, is

(1) 1/10 (2) 3/10

(3) 3 (4) 30

36. $0.3\overline{2}$ when expressed in the form p/q (p, q are integers $p \neq 0$) is

(1) 8/25 (2) 29/90

(3) 32/99 (4) 32/199

37. $23.\overline{43}$ when expressed in the form p/q (p, q are integers $q \neq 0$), is

(1) $\frac{2320}{99}$

(2) $\frac{2343}{100}$

(3) $\frac{2343}{999}$

(4) $\frac{2320}{199}$

38. The value of $0.\overline{23} + 0.\overline{22}$ is

(1) $0.\overline{45}$

(2) $0.\overline{43}$

(3) $0.\overline{44}$

(4) 0.45

39. Two lines AB and CD intersect at O. If $\angle AOC + \angle COB + \angle BOD = 270^\circ$ then $\angle AOC$,

(1) 70º

(2) 80º

(3) 90º

(4) 180º

40. If n (A ∪ B) = 60, n (A) = 25, n (B) = 45, then n(A ∩ B) is

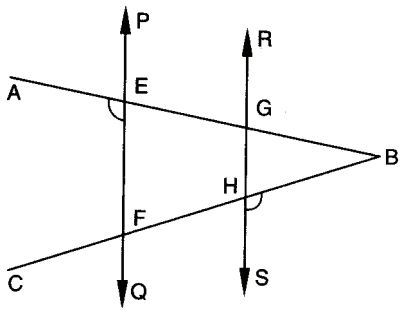
(1) 5

(2) ϕ

(3) 10

(4) 0

41. In figure PQ || RS, $\angle AEF = 95^\circ$, $\angle BHS = 110^\circ$ and $\angle ABC = x^\circ$. Then the value of x is



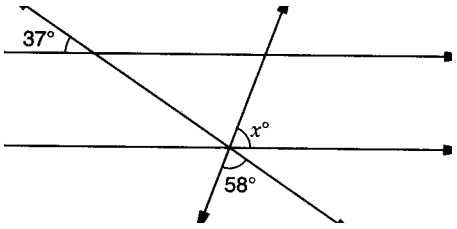
(1) 15º

(2) 25º

(3) 70º

(4) 35º

42. In figure, if $l_1 \parallel l_2$ what is the value of x?



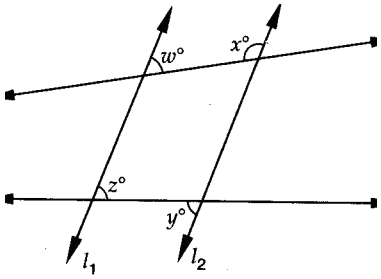
(1) 90º

(2) 85º

(3) 75º

(4) 70º

43. In figure, if $l_1 \parallel l_2$ what is x + y the value of z?



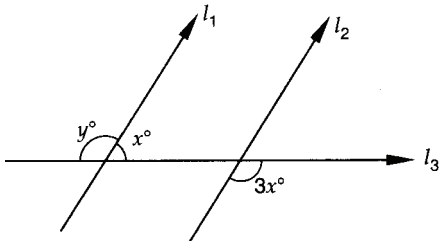
(1) 180º – w + z

(2) 180º + w – z

(3) 180º + w + z

(4) None of these

44. In figure, if $l_1 \parallel l_2$ what is the value of y?



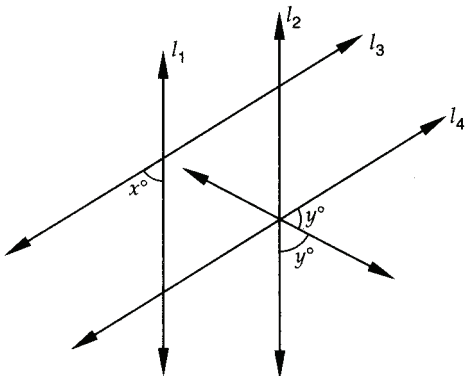
(1) 100º

(2) 120º

(3) 135º

(4) 150º

45. In figure, if $l_1 \parallel l_2$ and $l_3 \parallel l_4$ what is y in terms of x?



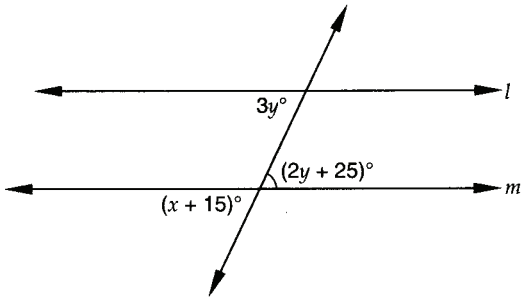
(1) 90 + x

(2) 90 + 2x

(3) $90 - \frac{x}{2}$

(4) 90 –2x

46. In figure, if $l \parallel m$ what is the value of x?



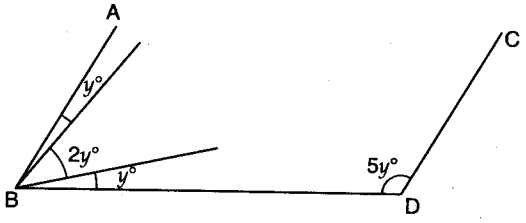
(1) 60º

(2) 50º

(3) 45º

(4) 30º

47. In figure if line segment AB is parallel to the line segment CD, what is the value of y?



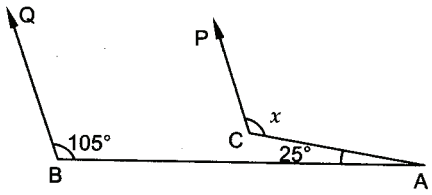
(1) 12º

(2) 15º

(3) 18º

(4) 20º

48. In figure if CP || BQ, then the measure of x is



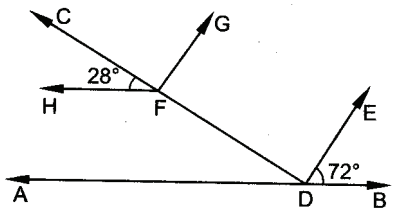
(1) 130º

(2) 105º

(3) 175º

(4) 125º

49. In figure if AB || HF and DE || FG, then the measure of $\angle$FDE is



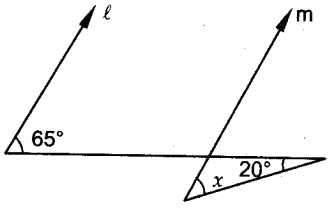
(1) 108º

(2) 80º

(3) 100º

(4) 90º

50. In figure if line *l* and *m* are parallel, then x =



(1) 20º

(2) 45º

(3) 65º

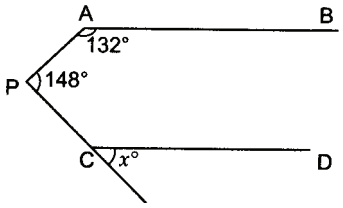
(4) 85º

INTERACTIVE SECTION

Student have to solve either left hand side (LHS) questions OR right hand side (RHS) questions. RHS section is for Harvard-MIT Mathematics Tournament (HMMT) enthusiasts. EHF will be conducting math camp (LEVEL-3) to help students prepare for online HMMT participation. The camp will be conducted by retired IIT-Delhi Maths Professors. All expenses will be borne by EHF. Equal preference will be given to students solving either of these sections. More details of online HMMT is available on EHF Website www.eduhealfoundation.org

LHS SECTION

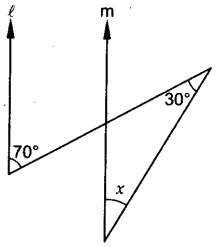
51. In figure if AB || CD, then x =



(1) 100º (2) 105º

(3) 110º (4) 115º

52. In figure if lines *l* and *m* are parallel lines, then x =



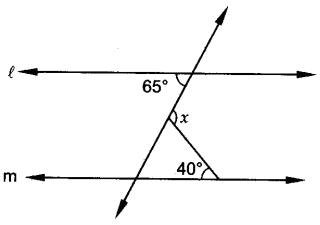
(1) 70º

(2) 100º

(3) 40º

(4) 30º

53. In figure if *l* || *m*, then x =



(1) 105º

(2) 65º

(3) 40º

(4) 25º

RHS SECTION

HMMT

51. How many perfect squares divide 10^{10} ?

(1) 36 (2) 35

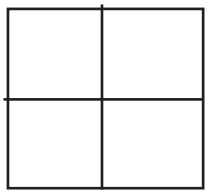
(3) 32 (4) 28

52. Evaluate $\frac{2016!^2}{2015!2017!}$. Here n! denotes 1 × 2 × .... × n.

(1) $\frac{2015}{2017}$ (2) $\frac{2014}{2017}$

(3) $\frac{2016}{2017}$ (4) none of these

53. A square can be divided into four congruent figures as shown



For how many n with $1 \le n \le 100$ can a unit square be divided into n congruent figures?

(1) 100

(2) 120

(3) 150

(4) 180

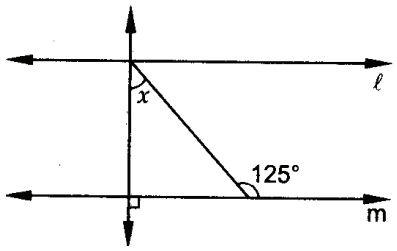
54. If x + 2y – 3z = 7 and 2x – y + 2z = 6, determine 8x + y.

(1) 42 (2) 32

(3) 28 (4) None of these

LHS SECTION

54. In figure, if lines *l* and *m* are parallel then the value of x is



(1) 55°
(2) 35°
(3) 65°
(4) 75°

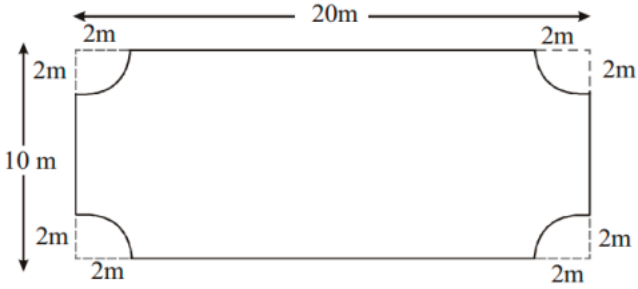
55. A copper wire, when bent in the form of a square, encloses an area of 484 cm^2. If the same wire is bent in the form of a circle, the radius of the circle will be

(1) 10 cm^2 (2) 15 cm^2
(3) 14 cm^2 (4) 21 cm^2

56. A car travels the first 1/3 of a certain distance with a speed of 10 km/h, the next one third distance with a speed of 20 km/h and last 1/3 distance with a speed of 60 km/h. The average speed of the car for the whole journey is

(1) 30 km/h (2) 24 km/h
(3) 18 km/h (4) 36 km/h

57. Evaluate the perimeter of the figure given below to one decimal place.



(1) 56.0 m (2) 56.6 m
(3) 57.2 m (4) 57.9 m

RHS SECTION

55. What is the smallest possible perimeter of a triangle whose side length are all squares of distinct positive integers ?

(1) 52

(2) 65

(3) 77

(4) None of these

56. If a and b satisfy the equations $a+\frac{1}{b}=4$ and $\frac{1}{a}+b=\frac{16}{15}$, determine the product of all possible values of ab.

(1) 5

(2) 3

(3) 1

(4) 4

57. I have five different pairs of socks. Every day for five days, I pick two socks at random without replacement to wear for the day. Find the probability that I wear matching socks on both the third day and the fifth day.

(1) $\frac{1}{52}$

(2) $\frac{1}{63}$

(3) $\frac{1}{45}$

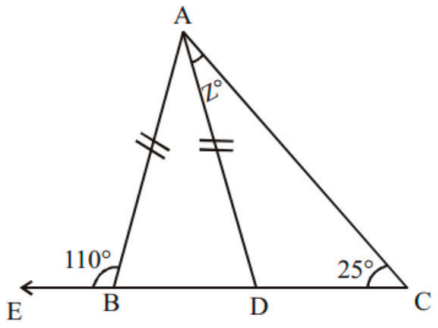
(4) None of these

58. Quadrilateral ABCD satisfies AB = 8, BC = 5, CD = 17, DA = 10. Let E be the intersection of AC and BD. Suppose BE : ED = 1 : 2. Find the area of ABCD.

(1) 30
(2) 40
(3) 60
(4) 70

LHS SECTION

58. In the figure, given below find $\angle Z$



(1) 40° (2) 110°

(3) 45° (4) None of these

59. The rates of simple interest in two banks A and B are in the ratio 5:4. A person wants to deposit his total savings in two banks in such a way that he received equal half yearly interest from both. He should deposit the saving in banks A and B in the ratio

(1) 4:5 (2) 2:5

(3) 5:2 (4) 5:4

60. A rail engine is moving at a uniform speed of 30 km per hour towards a place "X". When the engine is still 20 km away from "X", an insect starts at "X" and shuttles between "X" and engine at a uniform speed of 42 km per hour. The total distance travelled by the insect, by the time engine reaches "X" is

(1) 30 km (2) 28 km

(3) 20 km (4) 42 km

RHS SECTION

59. DeAndre Jordan shoots free throws that are worth 1 point each. He makes 40% of his shots If he takes two shots find the probability that he scores at least 1 point.

(1) $\frac{16}{25}$

(2) $\frac{15}{24}$

(3) $\frac{16}{20}$

(4) $\frac{18}{25}$

60. Point P_1 is located 600 miles West of point P_2. At 7:00 AM a car departs from P_1 and drives East at a speed of 50 miles per hour. At 8:00 AM another car departs from P_2 and drives West at a constant speed of x miles per hour. If the cards meet each other exactly halfway between P_1 and P_2, what is the value of x ?

(1) 50

(2) 60

(3) 30

(4) none of these

END OF THE EXAM