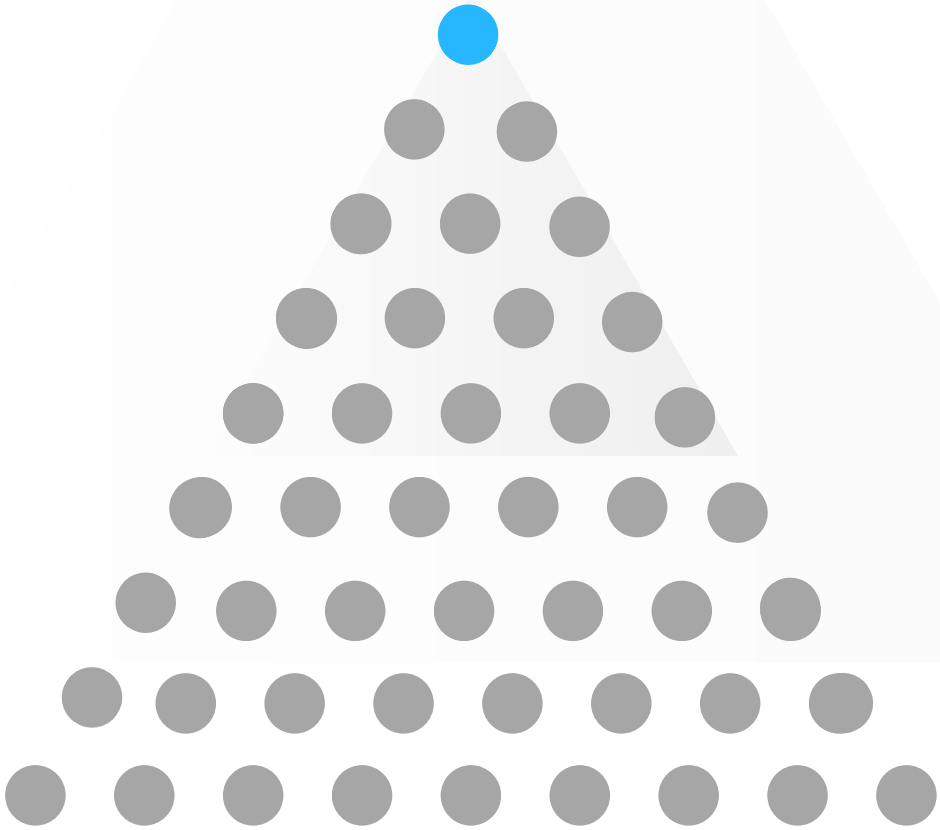
I THINKERS OLYMPIAD

CLASS 9 MATHEMATICS

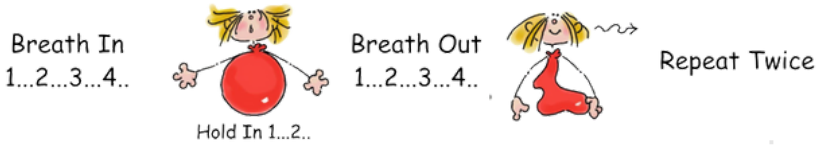
PAPER ID: 9M23



QUESTIONS: 30

DURATION: 60 MINS

INSTRUCTION: Carefully read the questions before answering. Darken only one oval for one question. More than one darken oval will result in incorrect response.
EACH QUESTION CARRIES 1 MARK. NO MARKS WILL BE CUT FOR WRONG ANSWERS.



Rough Work

1

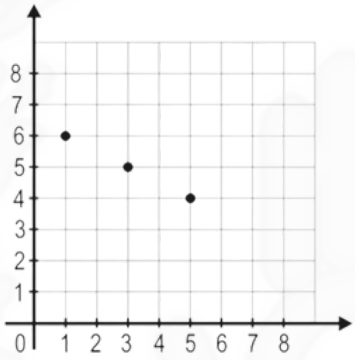
Which of these is the rational form of 0.842424242...?

A. $\frac{42}{50}$ **B**. $\frac{84}{100}$

C. $\frac{417}{495}$ **D**. $\frac{421}{500}$

2

Shown below are 3 points plotted on a grid. All the three points lie on a straight line.



Which of these points also lies on the same straight line?

A. (2, 5) **B**. (4, 4) **C**. (6, 3) **D**. (7, 3)

3

Given below is a polynomial.

$64\,x^3 - 36\,x^2\,y + 36\,xy^2 - 27\,y^3$

Which of these is a factor of this polynomial?

A. $2x^2 - 6xy + 3y^2$
B. $8x^2 + 72xy - 9y^2$
C. $16x^2 - 24xy + 9y^2$
D. $32x^2 - 36xy + 27y^2$

-3/4

4

Which of these represents a straight line parallel to y- axis?

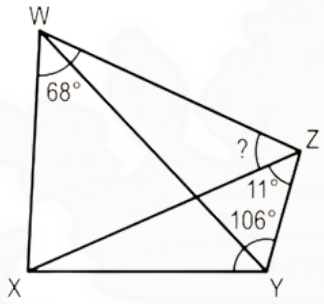
A. y = - 4 **B**. x = - 4

C. y = 2x **D**. x + y = 0

Rough Work

5 In the quadrilateral below, the diagonal XZ also forms the bisector of ∠WXY.

What is ∠WZX?



Note: the figure is not scale

A. 11° **B**. 49° **C**. 63° **D**. 79°

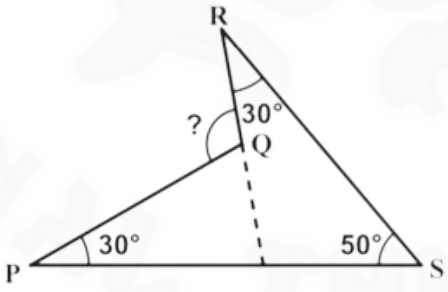
6 For what value of p is $\frac{p - 5}{p + 7}$ NOT a rational number?

A. - 7 **B**. 5
C. 6 **D**. All values of p

7 Which of these is a zero of 2(t + 2008) (t - 2009) (t + 2010)?

A. -2009 **B**. -2008 **C**. 2 **D**. 2010

8 As per the angles marked in the figure below.

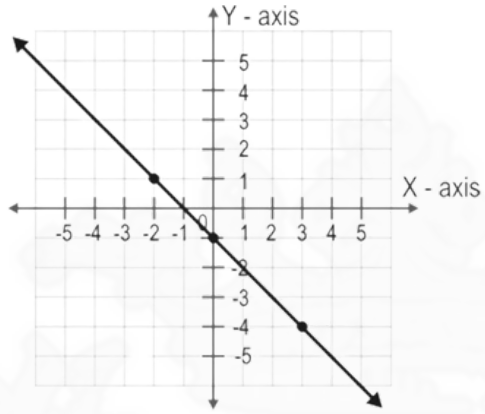


Find the angle ∠PQR?

A. 80° **B**. 100° **C**. 110° **D**. 120°

Rough Work

9 Which of these equations is shown in the below graph?



A. $y = x - 1$ **B**. $y = -1 - x$

C. $y = 1 + x$ **D**. $y = 2x - 2$

10 $\sqrt{7}$ is an irrational number. Which of the following is a RATIONAL number?

A. $(\sqrt{7})^{1/2}$ **B**. $(\sqrt{7})^{2}$

C. $\sqrt{7} + \sqrt{7}$ **D**. $(7 + \sqrt{7})^2$

11 Among the two quadrilaterals below, which of these have their diagonals always equal and perpendicular to each other?

(a) rectangle

(b) rhombus

A. Only (**B**. Only (b)

C. (a) and (b) **D**. Neither (a) nor (b)

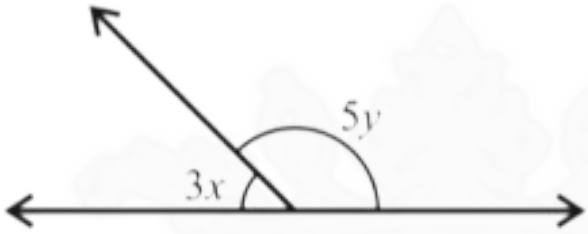
12 Which of the following COULD be the same as 3.16227766016837...?

(Note: the decimals do NOT repeat.)

A. $\frac{23}{7}$ **B**. $3 + \frac{4}{23}$ **C**. $\sqrt{10}$ **D**. $\sqrt{18}$

Rough Work

13 In the figure shown below, the value of x is 15°.



What is the value of y?

A. 27° **B**. 45° **C**. 75° **D**. 135°

14 A pair of values for the variables x and y which make the equation true is called the solution of the equation.

How many solution(s) does the equation y = 4x + 6 have?

A. One Solution **B**. Two Solutions
C. Three Solutions **D**. Infinite Solutions

15 The measure of ∠SPQ of rhombus EFGH is 60°.

Which of these claims is UNQUESTIONABLY true?

A. PR = QS **B**. PR = PQ **C**. QS = PQ **D**. None

16 Which of these could be the measures of the four angles of a quadrilateral?

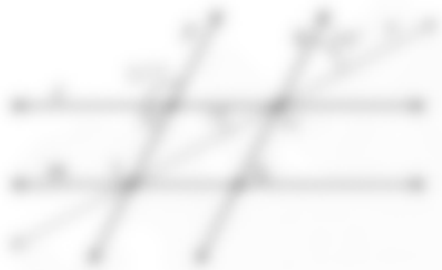
A. 120°, 120°, 120°, 120° **B**. 120°, 80°, 60°, 100°

C. 45°, 65°, 30°, 40° **D**. 100°, 75°, 95°, 80°

Rough Work

17

Lines l and m in the following figure are parallel to one another. Additionally parallel to one another are lines p and q.



Find the angle ∠HGL?

A. 63° B. 58° C. 34° D. 29°

18

PQRS is a quadrilateral

Which of the following sets of information will help you conclude that PQRS is definitely a parallelogram?

A. ∠P+∠S=180° and ∠Q + ∠R = 180°
B. ∠P=∠R and ∠Q=∠S
C. PS parallel to QR and PQ = SR
D. All of the above

19

Which of these points is 3 units above the x- axis and 4 units to the right of the y- axis?

A. (3, 4) B. (4, 3) C. (-3, 3) D. (4, -3)

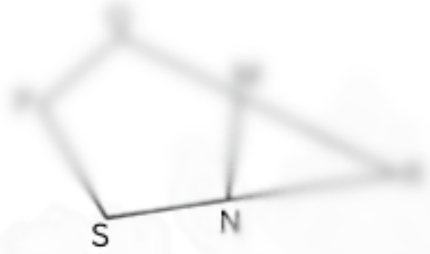
20

What is the constant term in the expansion of (5p + 3q - 6)2?

A. -36 B. 6 C. 4 D. 36

Rough Work

21 PQRS is a quadrilateral. Points M and N are the midpoints of sides QR and RS respectively.



Which of these is equal to the length of MN?

A. $\frac{1}{2}$ QS **B.** $\frac{1}{2}$ (QR + RS)

C. $\frac{1}{2}$ (PQ + QR + RS + SP) **D.** Can't say

22 Shown below are three points.

How many distinct lines can be drawn passing through both the points Q and R?

A. 2 **B.** 1

C. Infinite **D.** No lines

23 $(p - q)^2 + 4(p + q) - 4p = ?$

A. $p^2 + q^2 + 16$ **B.** $p^2 + q^2 - 16$

C. $p^2 + q^2 - 2pq - 16$ **D.** $p^2 + q^2 + 16 + 2pq - 8p - 8q$

24 What will the remainder be when

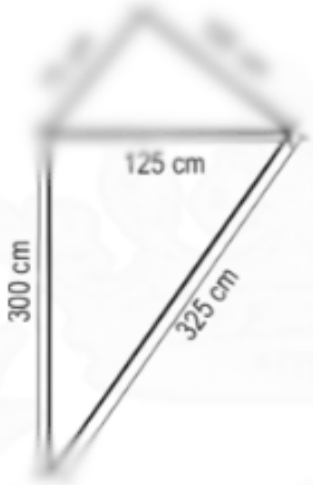
$(x - 3)^3 + (x - 2) + (x^2 - 9) + (x - 2)$ is divided by $(x - 3)$?

A. 1 **B.** 3 **C.** $(x - 2)$ **D.** $(x + 3)$

Rough Work

25

What is the area of the quadrilateral shown below?



A. [illegible]

B. 18750 cm²

C. [illegible]

D. 22500 cm²

26

The triangles below are two SCALENE triangles.

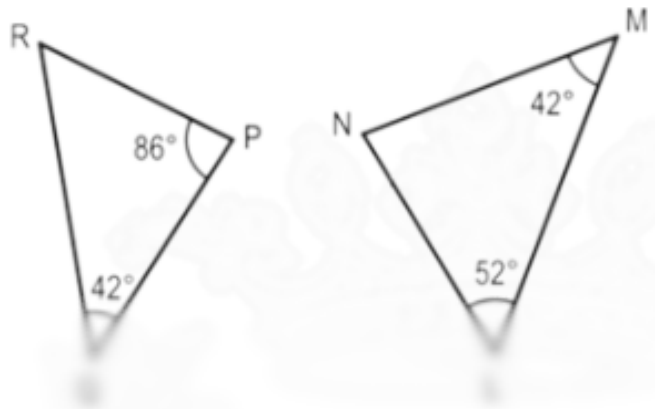
What can we say about these triangles?

A. They are definitely congruent.
B. They are definitely not congruent.
C. They will be congruent if one triangle is rotated.
D. It depends on the other angles of the triangle.

Rough Work

27

Look at ΔPQR and ΔLMN below.



Which of these information is sufficient to conclude the above two triangles congruent?

A. ∠R=52°

B. ∠N=∠P

C. LN=PR

D. QR=MN

28

Three vertices of a rectangle are (1, 4), (8, 4) and (1,8).

Which of these could be the fourth vertex?

A. (8,1)

B. (4,8)

C. (4,4)

D. (8,8)

29

The coordinate of a point Q is (2, -3).

Which of these describes the location of Q correctly?

A. 2 units above x-axis and 3 units left to y-axis

B. 2 units below x-axis and 3 units right to y-axis

C. 3 units above x-axis and 2 units left to y-axis

D. 3 units below x-axis and 2 units right to y-axis

30

Which of these will be equal to $11^{-3/4}$?

A. $11^{1/4} \times 11^{1/2}$

B. $11^{1/4} \times 11^{1/2}$

C. $11^{1/4} \div 11^{1/2}$

D. $11^{1/4} \div 11^{1/2}$

Rough Work

--------- End of the question paper ---------

Use it for Rough Work

Use it for Rough Work

This page doesn't contain any questions.

Until you receive your iThinkersOlympiad results, kindly hold onto the question paper as it will be essential for a complete understanding of your results.

INTERNATIONAL THINKERS OLYMPIAD

iThinkersOlympiad

BY

fivesep

Fivesep Pvt. Ltd.

We value your feedback!

We welcome your feedback and suggestion on this paper! Please email us at feedback@fivesep.in or visit

www.ithinkersolympiad.com/feedback

MATHS

PAPER ID: 9M23
QUESTIONS: 30
DURATION: 60 MINS

CLASS 9

2023