Exam ID: 110

National Level ScienceX Olympiads

ScienceX Mathematics Olympiad | Level 3

Name: _____

Date: _____

Exam Instructions

1. The timer has been set for the exam, and a countdown will display the remaining time. When the timer runs out, the exam will end automatically. No further action will be required after that.
2. You can flag any question that you want.
3. If you don't want to submit any of your provided answers, you can clear them.
4. If you choose to drop this exam, it will not be submitted, and no result will be generated.
5. Once you finish the exam, you cannot resume it.

Secure Exam Advice

This exam is specially secured. Which means you cannot leave your browser window once the exam starts.

The following actions are not supported during your exam.

- Minimizing the browser
- Resizing the browser
- Open a new tab
- Open a new program
- Taking a screenshot
- Pressing Ctrl + C
- Pressing Ctrl + V
- Pressing Print Screen
- Pressing F12

We are monitoring your activity during the exam, and any unusual behaviour is being tracked. Your admin has set the exam to terminate if a certain number of unusual activities are detected, which could be as low as one. To avoid your exam from being terminated, please refrain from any behaviour that may be considered unusual. All the best!

Question: 1 of 50 QID: 450 Marks: 4

Find the unit digit of 234 + 472 – 159

Please mark (✓) for the correct answer.

- ◯ **A.** 5
- ◯ **B.** 8
- ◯ **C.** 6
- ◯ **D.** 4

Question: 2 of 50 QID: 486 Marks: 4

The collection of information, collected for a purpose is called:

Please mark (✓) for the correct answer.

- **A.** Data
- **B.** Mean
- **C.** Mode
- **D.** Median

Question: 3 of 50 QID: 447 Marks: 4

ABC is a triangle with sides AB and BC of 4 cm and 5 cm respectively and angle ABC = 60°. Find the area of triangle ABC

Please mark (✓) for the correct answer.

- **A.** $7\sqrt{3}$
- **B.** $4\sqrt{3}$
- **C.** $3\sqrt{3}$
- **D.** $5\sqrt{3}$

Question: 4 of 50 QID: 487 Marks: 4

The total surface area of a cone whose radius is r/2 and slant height 2l is

Please mark (✓) for the correct answer.

- **A.** (b) πr(l+(r/4))
- **B.** (d) 2πrl
- **C.** (c) πr(l+r)
- **D.** (a) 2πr(l+r)

Question: 5 of 50 QID: 460 Marks: 4

HCF of 8, 9, 25 is

Please mark (✓) for the correct answer.

- **A.** (b) 9
- **B.** (c) 25
- **C.** (a) 8
- **D.** (d) 1

Question: 6 of 50 QID: 482 Marks: 4

The length of the longest pole that can be put in a room of dimensions (10 m × 10 m × 5m) is

Please mark (✓) for the correct answer.

- **A.** (a) 15m
- **B.** (d) 12m
- **C.** (b) 16m
- **D.** (c) 10m

Question: 7 of 50 QID: 491 Marks: 4

If P(E) = 0.44, then P(not E) will be:

Please mark (✓) for the correct answer.

- **A.** 0.55
- **B.** 0.50
- **C.** 0.44
- **D.** 0.56

Question: 8 of 50 QID: 483 Marks: 4

If the radius of a cylinder is 4cm and height is 10cm, then the total surface area of a cylinder is:

Please mark (✓) for the correct answer.

- **A.** 400 sq.cm
- **B.** 440 sq.cm
- **C.** 412 sq.cm
- **D.** 352 sq.cm.

Question: 9 of 50 QID: 459 Marks: 4

There are 312, 260 and 156 students in class X, XI and XII respectively. Buses are to be hired to take these students to a picnic. Find the maximum number of students who can sit in a bus if each bus takes equal number of students

Please mark (✓) for the correct answer.

- **A.** (a) 52
- **B.** (d) 63
- **C.** (c) 48
- **D.** (b) 56

Question: 10 of 50 QID: 464 Marks: 4

If b = 3, then any integer can be expressed as a =

Please mark (✓) for the correct answer.

- **A.** (b) 3q
- **B.** (c) none of the above
- **C.** (a) 3q, 3q+ 1, 3q + 2
- **D.** (d) 3q+ 1

Question: 11 of 50 QID: 463 Marks: 4

The product of two different irrational numbers is always

Please mark (✓) for the correct answer.

- **A.** (d) none of above
- **B.** (b) irrational
- **C.** (a) rational
- **D.** (c) both of above

Question: 12 of 50 QID: 472 Marks: 4

Ratios of sides of a right triangle with respect to its acute angles are known as

Please mark (✓) for the correct answer.

A. (c) trigonometric ratios of the angles
B. (d) none of these
C. (a) trigonometric identities
D. (b) trigonometry

Question: 13 of 50 QID: 452 Marks: 4

The curved Surface Area of the cylinder is 198 cm2 of which radius is 7 cm. Then find the volume of the cylinder (in cm3)?

Please mark (✓) for the correct answer.

A. 693
B. 689
C. 672
D. 682

Question: 14 of 50 QID: 451 Marks: 4

If tan (x+y) tan (x-y) = 1, then find tan (2x/3)?

Please mark (✓) for the correct answer.

A. $2/\sqrt{3}$
B. 1/2
C. $1/\sqrt{2}$
D. $1/\sqrt{3}$

Question: 15 of 50 QID: 488 Marks: 4

The number of planks of dimensions (4 m × 50 cm × 20 cm) that can be stored in a pit that is 16 m long, 12m wide and 4 m deep is

Please mark (✓) for the correct answer.

A. (a) 1900
B. (d) 1840
C. (c) 1800
D. (b) 1920

Question: 16 of 50 QID: 454 Marks: 4

ABCD is a trapezium in which AB is parallel to CD. AB= 8cm & CD=12cm. If the midpoints of the diagonal AC & BD are joined then find its length.

Please mark (✓) for the correct answer.

A. 6
B. 4
C. 1
D. 2

Question: 17 of 50 QID: 473 Marks: 4

If x tan 45° sin 30° = cos 30° tan 30°, then x is equal to

Please mark (✓) for the correct answer.

- **A.** (b) 12
- **B.** (d) 1
- **C.** (c) 1/√2
- **D.** (a) √3

Question: 18 of 50 QID: 467 Marks: 4

The sum of all two digit odd numbers is

Please mark (✓) for the correct answer.

- **A.** (b) 2475
- **B.** (a) 2575
- **C.** (d) 2425
- **D.** (c) 2524

Question: 19 of 50 QID: 474 Marks: 4

What is the minimum value of sin A, $0 \leq A \leq 90°$

Please mark (✓) for the correct answer.

- **A.** (d) 12
- **B.** (c) 1
- **C.** (a) -1
- **D.** (b) 0

Question: 20 of 50 QID: 469 Marks: 4

A ticket is drawn at random from a bag containing tickets numbered from 1 to 40. The probability that the selected ticket has a number which is a multiple of 5 is

Please mark (✓) for the correct answer.

- **A.** 3/25
- **B.** 3/5
- **C.** 1/5
- **D.** 2/5

Question: 21 of 50 QID: 468 Marks: 4

The number of multiples lie between n and n^2 which are divisible by n is

Please mark (✓) for the correct answer.

- **A.** (b) n
- **B.** (c) n – 1
- **C.** (d) n – 2
- **D.** (a) n + 1

Question: 22 of 50 QID: 478 Marks: 4

The following table shows the data of total numbers of students of 5 schools (A, B, C, D &E) and the respective ratio of boys and girls in the given schools.

School	Total students	Boys : Girls
A	145	2:3
B	384	11:13
C	144	5:7
D	125	4:1
E	198	5:6

Total numbers of boys in school E & girls in school B?

Please mark (✓) for the correct answer.

- **A.** 256
- **B.** 278
- **C.** 298
- **D.** 248

Question: 23 of 50 QID: 481 Marks: 4

Study the following table and answer the question that follows.

A school has four sections A, B, C and D of Class IX students. The results of Science and Mathematics examinations are shown in the following table.

RESULT	No. of Students			
	Section A	Section B	Section C	Section D
Failed in both	24	25	18	20
Failed in Science but passed in Mathematics	14	12	10	15
Passed in Science but failed in Mathematics	7	6	8	10
Passed in both	63	60	56	55

What percentage of students of section C Passed in Science but failed in Mathematics?

Please mark (✓) for the correct answer.

- **A.** 9.85%
- **B.** 9.20%
- **C.** 10.30%
- **D.** 8.70%

Question: 24 of 50 QID: 449 Marks: 4

The angle of elevation of the sun, when the length of the shadow of a tree is $1/\sqrt{3}$ times the height of the tree, is:

Please mark (✓) for the correct answer.

- **A.** 90 degrees
- **B.** 45 degrees
- **C.** 60 degrees
- **D.** 30 degrees

Question: 25 of 50 QID: 479 Marks: 4

The following table shows the imports and exports (in Rs. crore) of a country over 4 years (2016 to 2019).

Years	2016	2017	2018	2019
Imports	125	145	165	188
Exports	130	150	175	200

The average trade balance (in Rs. crore) is:

Please mark (✓) for the correct answer.

- **A.** 6
- **B.** 12
- **C.** 8
- **D.** 4

Question: 26 of 50 QID: 495 Marks: 4

The sides of a triangle are 122 m, 22 m and 120 m respectively. The area of the triangle is:

Please mark (✓) for the correct answer.

- **A.** 1320 sq.m
- **B.** 1420 sq.m
- **C.** 1400 sq.m
- **D.** 1300 sq.m

Question: 27 of 50 QID: 493 Marks: 4

Performing an event once is called

Please mark (✓) for the correct answer.

- **A.** b. Trial
- **B.** c. Error
- **C.** d. None of the above
- **D.** a. Sample

Question: 28 of 50 QID: 476 Marks: 4

$$\frac{\cos 20^0}{\sin 70^0} + \frac{\cos\theta}{\sin(90^0-\theta)} = \underline{\qquad\qquad}.$$

Please mark (✓) for the correct answer.

- **A.** 1/2
- **B.** 2
- **C.** -2
- **D.** -1/2

Question: 29 of 50 QID: 457 Marks: 4

If the diameter of a sphere is 3.5 cm, then what is the total surface area of the sphere?

Please mark (✓) for the correct answer.

- **A.** 45.75 cm2
- **B.** 42.6 cm2
- **C.** 38.5 cm2
- **D.** 34.25 cm2

Question: 30 of 50 QID: 492 Marks: 4

A batsman hits boundaries for 6 times out of 30 balls. Find the probability that he did not hit the boundaries.

Please mark (✓) for the correct answer.

- **A.** ⅖
- **B.** ⅕
- **C.** ⅗
- **D.** ⅘

Question: 31 of 50 QID: 458 Marks: 4

If two positive integers A and B can be expressed as A = xy3 and B = xiy2z; x, y being prime numbers, the LCM (A, B) is

Please mark (✓) for the correct answer.

- **A.** (c) x4y3
- **B.** (a) xy^2
- **C.** (d) x4y3z
- **D.** (b) $x4y^2z$

Question: 32 of 50 QID: 465 Marks: 4

The total number of events of throwing 10 coins simultaneously is

Please mark (✓) for the correct answer.

- **A.** (a) 1024
- **B.** (c) 100
- **C.** (b) 512
- **D.** (d) 10

Question: 33 of 50 QID: 453 Marks: 4

Radius of cylinder is 5 cm & height is 15cm . Find the approx difference between its volume and Curved Surface area.

Please mark (✓) for the correct answer.

- **A.** 700
- **B.** 670
- **C.** 707
- **D.** 730

Question: 34 of 50 QID: 462 Marks: 4

The set A = {0,1, 2, 3, 4, … 99999999} represents the set of

Please mark (✓) for the correct answer.

- **A.** (c) natural numbers
- **B.** (d) even numbers
- **C.** (a) whole numbers
- **D.** (b) integers

Question: 35 of 50 QID: 446 Marks: 4

If the length of certain rectangle is decreased by 4 cm and breadth is increased by 2 cm, it would result in a square of the same area. What is the perimeter of the original rectangle?

Please mark (✓) for the correct answer.

- **A.** 10
- **B.** 20cm
- **C.** 24cm
- **D.** 15cm

Question: 36 of 50 QID: 461 Marks: 4

The least number that is divisible by all the numbers from 1 to 8 (both inclusive) is

Please mark (✓) for the correct answer.

- **A.** (d) 420
- **B.** (b) 2520
- **C.** (c) 8
- **D.** (a) 840

Question: 37 of 50 QID: 470 Marks: 4

If in ΔABC, ∠C = 90°, then sin (A + B) =

Please mark (✓) for the correct answer.

- **A.** (a) 0
- **B.** (d) 1
- **C.** (b) 1/2
- **D.** (c) 12√

Question: 38 of 50 QID: 477 Marks: 4

The following table shows the data of students in five schools and the ratio of absent and present students on a particular day.

School	Total students	Absent : Present
A	156	5 : 7
B	147	4 : 3
C	132	5 : 6
D	238	8: 9
E	207	11 : 12

The ratio of Absent students in B to present students in E.

Please mark (✓) for the correct answer.

- **A.** 14:23
- **B.** 15:28
- **C.** 7:9
- **D.** 7:22

Question: 39 of 50 QID: 489 Marks: 4

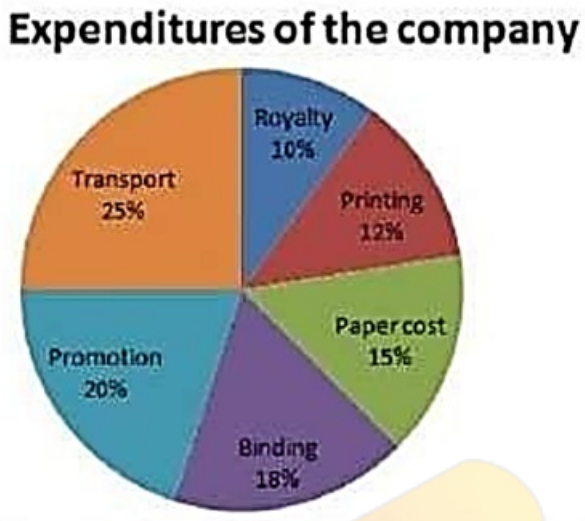
The median of the data: 17, 2, 7, 27, 15, 5, 14, 8, 10, 24, 48, 10, 8, 7, 18, 28 is:

Please mark (✓) for the correct answer.

- **A.** 12
- **B.** 8
- **C.** 24
- **D.** 10

Question: 40 of 50 QID: 480 Marks: 4

arious expenditures incurred by a publishing company for publishing a book in 2018 are given in the following pie-chart. Study the chart and answer the question.



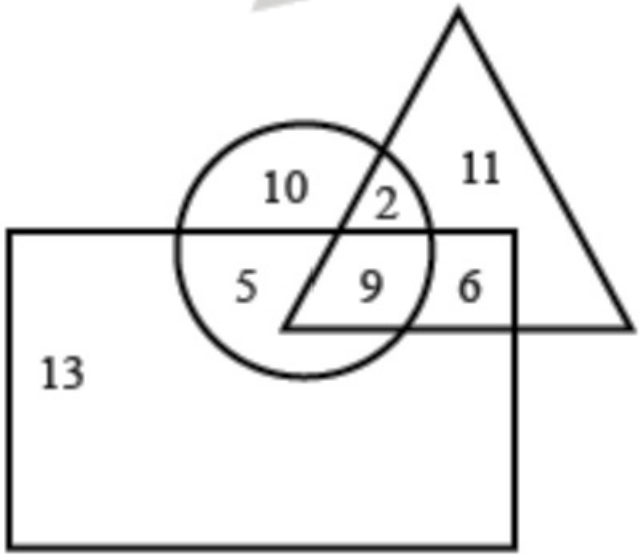
Price printed on a book is 15% above the cost price. If the price printed on a book is Rs. 942, then the cost of paper for a single copy in rupees is (rounded off to One decimal place)

Please mark (✓) for the correct answer.

- **A.** Rs. 188.5
- **B.** Rs. 182.5
- **C.** Rs. 122.9
- **D.** Rs. 220.6

Question: 41 of 50 QID: 445 Marks: 4

In the given Venn diagram, the 'rectangle' represents 'travellers who like to travel by plane', the 'circle' represents 'travellers who like to travel by bus', and the 'triangle' 'represents travellers who like to travel by train'. The numbers given in the diagram represent the number of travellers in that particular category.



How many travellers like to travel either by train or plane but NOT by bus?

Please mark (✓) for the correct answer.

- **A.** 30
- **B.** 27
- **C.** 29
- **D.** 36

Question: 42 of 50 QID: 485 Marks: 4

A triangle and a parallelogram has same base and same area as shown in the diagram below. Dimensions of triangle are 28cm, 26cm and 30cm with 28cm being the base. What is the height of the parallelogram?

Please mark (✓) for the correct answer.

- **A.** c) 12cm
- **B.** b) 10cm
- **C.** a) 15cm
- **D.** d) 18cm

Question: 43 of 50 QID: 494 Marks: 4

Empirical probability is also known as

Please mark (✓) for the correct answer.

- **A.** d. None of the above
- **B.** a. Classic probability
- **C.** b. Subjective probability
- **D.** c. Experimental probability

Question: 44 of 50 QID: 448 Marks: 4

If $x+1/x=1$, then the value of $x^{12} + x^9 + x^6 + x^3 + 1$ is:

Please mark (✓) for the correct answer.

- **A.** -1
- **B.** -2
- **C.** 0
- **D.** 1

Question: 45 of 50 QID: 466 Marks: 4

The (n – 1)th term of an A.P. is given by 7,12,17, 22,... is

Please mark (✓) for the correct answer.

- **A.** (a) 5n + 2
- **B.** (b) 5n + 3
- **C.** (d) 5n – 3
- **D.** (c) 5n – 5

Question: 46 of 50 QID: 490 Marks: 4

If each data in the observation is increased by 5, then the mean

Please mark (✓) for the correct answer.

- **A.** Increased by 5
- **B.** None of the above
- **C.** Remains the same
- **D.** Decreased by 5

Question: 47 of 50 QID: 455 Marks: 4

(3√3x3 + 5√5y3)/(√3x + √5y) = Ax2 + By2 + Cxy, Find A2 + B2 + C2?

Please mark (✓) for the correct answer.

- **A.** 49
- **B.** 64
- **C.** 36
- **D.** 25

Question: 48 of 50 QID: 484 Marks: 4

The radius of a hemispherical balloon increases from 6 cm to 12 cm as air is being pumped into it. The ratio of the surface areas of the balloon in the two cases is

Please mark (✓) for the correct answer.

- **A.** (a) 1:4
- **B.** (d) 2:1
- **C.** (c) 2:3
- **D.** (b) 1:3

Question: 49 of 50 QID: 471 Marks: 4

If x and y are complementary angles, then

Please mark (✓) for the correct answer.

- **A.** (a) sin x = sin y
- **B.** (b) tan x = tan y
- **C.** (d) sec x = cosec y
- **D.** (c) cos x = cos y

Question: 50 of 50 QID: 456 Marks: 4

ABC is a triangle, OB and OC are the bisectors of angle ABC and angle ACB. If angle BAC =75, then find angle BOC.

Please mark (✓) for the correct answer.

- **A.** 127.5
- **B.** 125
- **C.** 130
- **D.** 132.5

--- END OF QUESTION PAPER ---

Answer Key

No	Question Type	QID	Correct Answer
Question - 1	Multiple Choice (Radiobutton)	450	A
Question - 2	Multiple Choice (Radiobutton)	486	A
Question - 3	Multiple Choice (Radiobutton)	447	D
Question - 4	Multiple Choice (Radiobutton)	487	A
Question - 5	Multiple Choice (Radiobutton)	460	D
Question - 6	Multiple Choice (Radiobutton)	482	A
Question - 7	Multiple Choice (Radiobutton)	491	D
Question - 8	Multiple Choice (Radiobutton)	483	D
Question - 9	Multiple Choice (Radiobutton)	459	A
Question - 10	Multiple Choice (Radiobutton)	464	C
Question - 11	Multiple Choice (Radiobutton)	463	B
Question - 12	Multiple Choice (Radiobutton)	472	A
Question - 13	Multiple Choice (Radiobutton)	452	A
Question - 14	Multiple Choice (Radiobutton)	451	D
Question - 15	Multiple Choice (Radiobutton)	488	D
Question - 16	Multiple Choice (Radiobutton)	454	D
Question - 17	Multiple Choice (Radiobutton)	473	B
Question - 18	Multiple Choice (Radiobutton)	467	A
Question - 19	Multiple Choice (Radiobutton)	474	D
Question - 20	Multiple Choice (Radiobutton)	469	C
Question - 21	Multiple Choice (Radiobutton)	468	C
Question - 22	Multiple Choice (Radiobutton)	478	C
Question - 23	Multiple Choice (Radiobutton)	481	D
Question - 24	Multiple Choice (Radiobutton)	449	C
Question - 25	Multiple Choice (Radiobutton)	479	C
Question - 26	Multiple Choice (Radiobutton)	495	A
Question - 27	Multiple Choice (Radiobutton)	493	A
Question - 28	Multiple Choice (Radiobutton)	476	B
Question - 29	Multiple Choice (Radiobutton)	457	C
Question - 30	Multiple Choice (Radiobutton)	492	D
Question - 31	Multiple Choice (Radiobutton)	458	C
Question - 32	Multiple Choice (Radiobutton)	465	A
Question - 33	Multiple Choice (Radiobutton)	453	C
Question - 34	Multiple Choice (Radiobutton)	462	C
Question - 35	Multiple Choice (Radiobutton)	446	B
Question - 36	Multiple Choice (Radiobutton)	461	D
Question - 37	Multiple Choice (Radiobutton)	470	B
Question - 38	Multiple Choice (Radiobutton)	477	C
Question - 39	Multiple Choice (Radiobutton)	489	A
Question - 40	Multiple Choice (Radiobutton)	480	C
Question - 41	Multiple Choice (Radiobutton)	445	A
Question - 42	Multiple Choice (Radiobutton)	485	A
Question - 43	Multiple Choice (Radiobutton)	494	D

No	Question Type	QID	Correct Answer
Question - 44	Multiple Choice (Radiobutton)	448	D
Question - 45	Multiple Choice (Radiobutton)	466	C
Question - 46	Multiple Choice (Radiobutton)	490	A
Question - 47	Multiple Choice (Radiobutton)	455	A
Question - 48	Multiple Choice (Radiobutton)	484	A
Question - 49	Multiple Choice (Radiobutton)	471	C
Question - 50	Multiple Choice (Radiobutton)	456	A

--- END OF ANSWER KEY ---