



CREST Mental Maths Olympiad (CMMO)

Sample Paper

Pattern and Marking Scheme

Grade	Topic/Section	No. of Questions	Marks per Question	Total Marks
Grade 8	Basique	80	1	80
	Avance	20	2	40
Grand Total		100		120

The total duration of the exam is 60 minutes.

Syllabus

Number System

- Integers
- Rational number and its properties

Algebra

- Algebraic expressions
- Simple equations

Square and Square Roots

- Square of a number
- Square roots
- Square roots of decimals

Cube and Cube Roots

- Cube of a number
- Cube roots

Comparing Quantities

- a. Ratio and proportion
- b. Percentage
- c. Profit and loss
- d. Simple interest
- e. Compound interest
- f. Problems on ages
- g. Time and work
- h. Average
- i. Partnership
- j. Time and distance

Mensuration

- a. Area of Shapes (Trapezium, General quadrilateral & Circle)
- b. Surface area of cube
- c. Surface area of cuboid
- d. Surface area of cylinder
- e. Surface area of cone, etc.
- f. Volume of cube
- g. Volume of cuboid
- h. Volume of cylinder
- i. Volume of cone, etc.

Playing with Numbers

- a. Exponents
- b. Mathematical reasoning
- c. Tests of divisibility
- d. H.C.F and L.C.M
- e. Numbers pattern

Data Handling and Symmetry

- a. Bar graph
- b. Line graph
- c. Symmetry

Geometry

- a. Lines and angles

For more details, visit <https://www.crestolympiads.com/mental-maths-mmo>

Basique (Each Question is 1 Mark)

- Solve: $7^2 + 8^2 - 11^2$
 - 12
 - 7
 - 8
 - 5
- What is the square root of 1156?
 - 32
 - 34
 - 36
 - 38
- Find the cube root of 1728?
 - 8
 - 9
 - 11
 - 12
- If the ratio of three numbers is 2 : 3 : 5 and their product is 2700, what is the smallest of the three numbers?
 - 180
 - 270
 - 450
 - 530
- A clothing store has a total of 250 shirts in stock. If they sold 60% of the shirts, how many shirts are still left in the store?
 - 60
 - 08
 - 100
 - 120
- What will come in place of question mark (?) in the number series?
1, 9, 25, 49, 81, ?
 - 99
 - 121
 - 144
 - 169
- Sofia got 80, 85, 90, 75, and 70 marks in her five subjects. What is her average marks?
 - 80 marks
 - 85 marks
 - 90 marks
 - 95 marks
- A train travels at a speed of 80 km/h for 2 hours and then at a speed of 60 km/h for the next 3 hours. What is the average speed of the train for the entire journey?
 - 52 km/h
 - 58 km/h
 - 62 km/h
 - 68 km/h

18. Find the value:

$$\frac{x}{2} + \frac{x}{3} + \frac{x}{4}$$

a. $\frac{17x}{12}$

b. $\frac{17x}{8}$

c. $\frac{13x}{8}$

d. $\frac{13x}{12}$

19. Simplify the expression:

$$(4x - 3y) - (2x + 5y)$$

a. $2x - 8y$

b. $3x - 7y$

c. $2y - 3x$

d. $3y - 7x$

20. If $2x + 9 = 47$, Find x:

a. 16

b. 14

c. 17

d. 19

21. Umex has three boxes of different fruits. A weighs 5 kg more than box B and box weighs 10 kg more than box B. The total weight of three boxes is 48 kg. How many kg does box A weigh?

a. 8 kg

b. 4 kg

c. 16 kg

d. 11 kg

22. Find the value of x:

$$\frac{3}{4x - 5} = \frac{7}{2x + 3}$$

a. 3

b. 4

c. 5

d. 2

23. Find the square of 24.

a. 647

b. 625

c. 336

d. 576

24. How much is $25^2 - 23^2$?

a. 96

b. 104

c. 89

d. 101

25. What will be the positive value of x , when $4(x + 9)^2 = 676$?

- a. 6
- b. 8
- c. 12
- d. 4

26. Find: $(\sqrt{4900} \div 10)^2 = \underline{\hspace{2cm}}$.

- a. 70
- b. 4900
- c. 7
- d. 49

27. Find the value of: $\sqrt{0.0081}$

- a. 0.09
- b. 0.9
- c. 0.009
- d. 0.03

28. What is $113 - 103$?

- a. 221
- b. 281
- c. 381
- d. 331

29. What will be the next number in the given series?

64, 125, 216, _____

- a. 343
- b. 256
- c. 512
- d. 296

30. Find the value of x :

$$(216)^x = 6^8$$

- a. 4
- b. 5
- c. 7
- d. 9

31. Find the cube root of -1728 .

- a. -14
- b. -11
- c. -13
- d. -12

32. Fill in the blank:

The minimum number of digits in the cube of a 4-digit number is _____.

- a. 9
- b. 8
- c. 10
- d. 11

33. Find the ratio of speed of a car and truck travelling 150 km in 3 hours and 120 km in 4 hours respectively.

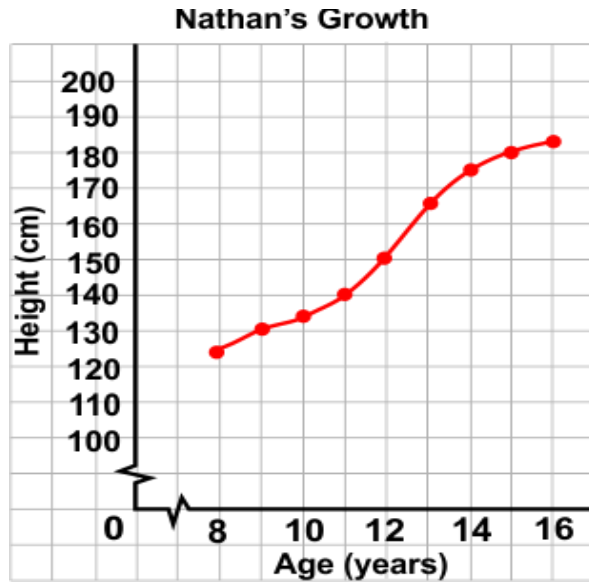
- a. 4 : 5
- b. 7 : 3
- c. 5 : 3
- d. 3 : 7

34. What must be multiplied by each of the numbers 5, 9, 7, and 12 to obtain the proportion numbers?
- a. 3
b. 5
c. 4
d. 7
35. If a box contains 12 items and 3 of them are defective, what percentage of the items are defective?
- a. 25%
b. 18%
c. 17%
d. 20%
36. A shopkeeper bought a watch for \$600 and sold it for \$800. What is his profit or loss?
- a. \$100 loss
b. \$200 profit
c. \$200 loss
d. \$100 profit
37. A man bought a bicycle for \$80 and sold it for \$100. What is the profit percentage?
- a. 25%
b. 10%
c. 55%
d. 40%
38. Fill in the blank:
S.P. = $\frac{100 + \text{Profit}\%}{\text{_____}}$ \times C.P.
- a. Loss
b. 100
c. Profit%
d. Profit
39. Anni has taken a loan of \$9000 at a simple interest rate of 12% per annum for 4 years. Calculate the simple interest she will have to pay.
- a. \$4,230
b. \$4,106
c. \$4,016
d. \$4,320
40. If father is twice as old as his son and also 29 years older than his son. What is the age of father?
- a. 58 years
b. 48 years
c. 53 years
d. 47 years
41. The age of father is 30 years more than that of his son. 5 years hence father's age will be thrice of his son's age, find son present ages.
- a. 12 years
b. 10 years
c. 15 years
d. 40 years

42. 30 persons can complete a piece of work in 18 days. How many more persons needed if the work is to be completed in 12 days?
- a. 12
b. 24
c. 15
d. 13
43. 16 persons need 56 kg of rice in 1 week. How much rice will be needed by 24 persons in four weeks?
- a. 336 kg
b. 324 kg
c. 431 kg
d. 423 kg
44. The marks obtained by ten students in Mathematics in the annual examination are as follows: 76, 61, 87, 56, 42, 64, 73, 68, 50, 73. What is their average marks in mathematics?
- a. 45
b. 35
c. 65
d. 64
45. James, Nike and Scott started a business in partnership by investing in the ratio of 6 : 5 : 8 respectively. At the end of the year, they earned a profit of \$83,600. What will be Scott's share?
- a. 4 : 5
b. 3 : 1
c. 2 : 7
d. 5 : 3
46. Raxon started a business by investing \$45,000. 6 months later joined him with \$30,000. In what ratio should the earned profit be distributed at the end of the year?
- a. \$24,700
b. \$39,290
c. \$32,895
d. \$35,200
47. Find the missing number:
1, 3, 6, 10, 15, ?
- a. 21
b. 19
c. 17
d. 20
48. Find the missing number:
4, 9, 16, 25, ?
- a. 30
b. 28
c. 36
d. 32

- a. 12
- b. 2
- c. 8
- d. 10

68. Given below is the line graph, which shows the height of Nathan during his ages. Answer the question based on a line graph. During which year did Nathan grow the most?



- a. 14 - 16
- b. 12 - 14
- c. 8 - 10
- d. 10 - 12

69. In the given rectangle, state the number of lines of symmetry.



- a. 2
- b. 4
- c. 6
- d. 3

70. Find the number of lines of symmetry in the given figure:



- a. 1
- b. 0
- c. 3
- d. 4

77. Solve: $1\frac{1}{4} + 1\frac{5}{9} \times 1\frac{5}{8} \div 6\frac{1}{2} = ?$

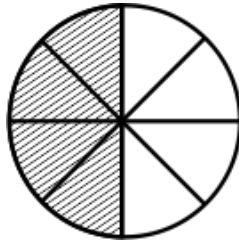
a. $1\frac{23}{36}$

b. $2\frac{3}{4}$

c. $1\frac{21}{36}$

d. $2\frac{24}{36}$

78. Express the figure given below as a rational number.



a. $\frac{12}{8}$

b. $\frac{4}{8}$

c. $\frac{6}{8}$

d. 1

79. The sum of two rational numbers is -8 . If one of the numbers is $\frac{-21}{8}$. Find the other number.

a. $\frac{-43}{8}$

b. $\frac{-25}{8}$

c. $\frac{-37}{8}$

d. $\frac{-53}{8}$

80. The product of two rational numbers is $\frac{15}{11}$. If one rational number is $\frac{5}{9}$ then find the other.

a. $\frac{29}{11}$

b. $\frac{27}{11}$

c. $\frac{24}{11}$

d. $\frac{23}{11}$

Avance (Each Question is 2 Marks)

81. A circular swimming pool has a circumference of 66 meters. What is the area of the pool?

- a. 574 m²
- b. 592 m²
- c. 601 m²
- d. 616 m²

82. Evaluate: $(9^3 - 6^3) \times (3/5)^{-3}$

- a. 2265
- b. 2375
- c. 2475
- d. 2585

83. Simplify the expression:

$$(14x - 3y)(2x + 25y) - (-45x + 21y)$$

- a. $32x^2 - 84y^2 + 339xy - 11y$
- b. $28x^2 - 75y^2 + 389xy - 21y$
- c. $13x^2 - 44y^2 + 239xy - 51y$
- d. $23x^2 - 44y^2 + 321xy - 23y$

84. Find the value of x.

$$\frac{4+x}{3} + \frac{7}{4} = \frac{3-x}{2} + \frac{5}{4}$$

- a. 3/5
- b. -2/5
- c. -7/5
- d. 8/5

85. Find: $\sqrt{16} \times \sqrt{49} \times \sqrt{121}$

- a. 197
- b. 308
- c. 279
- d. 348

86. Find: $\sqrt[3]{343} \times \sqrt{784} = \underline{\hspace{2cm}}$

- a. 18
- b. 14
- c. 19
- d. 12

87. The price of a computer is \$48,000. The sales tax charged was 4%, what is the amount to be paid by Mr. Jordan?

- a. \$42,099
- b. \$47,970
- c. \$49,920
- d. \$49,862

88. If a dress is priced at \$60 and is on sale for 20% off, how much will the dress cost?

- a. \$26
- b. \$32
- c. \$34
- d. \$48

