



CREST Mathematics Olympiad (CMO)

Previous Year Paper (2023-24)

Class 7 (Set - A)

Time Allowed: 1 hour

Maximum Marks: 60

- Additional **10 minutes** will be allotted to fill up information on the OMR Sheet, before the start of the exam.
- Fill in all the mandatory fields clearly on the OMR Sheet.
- There are a total of **50 questions** in this booklet comprising **2 sections** namely the **Practical Mathematics & Achievers' Section** consisting of **40 questions (1 mark each) & 10 questions (2 marks each)** respectively.
- There is no negative marking. The use of a calculator is not permitted.
- There is **only ONE correct option** to a given question.
- Use **HB Pencil or Blue / Black ball point pen only** for marking the correct choice of answers on the OMR Sheet.
- Rough work is to be done in the space provided in the test booklet. Extra plain sheet may be provided by the school for the rough work.
- The OMR Sheet is to be handed over to the invigilator at the end of the exam.
- No candidate is allowed to carry any textual material, printed or written, bits of paper, any electronic device, etc. inside the examination hall.
- The use of unfair means may result in the cancellation of the exam. Any such instances may be reported at **+91-98182-94134** or **info@crestolympiads.com**

DO NOT OPEN THIS BOOKLET UNTIL ASKED TO DO SO

FILL IN THE DETAILS

Candidate Name: _____

Class: _____ Section: _____

CREST ID: _____

Practical Mathematics (Each Question is 1 Mark)

1. Fill in the blank:
 $(11.25 - 3.5 + 7.5) / (12.25 \div 3.5 + 4.5)$
 _____ $(7.5 + 3.25 - 1.25) / (12.25 \div 2.5 + 3.5)$

- a. > b. <
 c. = d. \equiv

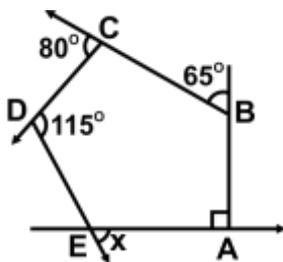
2. In triangles ABC and PQR, $\angle B = 90^\circ$, $AC = 8$ cm, $AB = 3$ cm, $\angle P = 90^\circ$, $PR = 3$ cm, $QR = 8$ cm. By which congruence rule are the two triangles congruent?

- a. SSS congruence property
 b. SAS congruence property
 c. ASA congruency property
 d. RHS congruence property

3. The average mark in Maths subject for a class of 30 students is 62.25. If 10 more students are added to the class, the average mark becomes 68.5. Find the total marks of the 10 new students:

- a. 795.5 b. 815.5
 c. 856.5 d. 872.5

4. ABCDE is a five-sided polygon. Find the measure of angle x in the figure:



- a. 60° b. 80°
 c. 120° d. 140°

5. Simplify the following:

$$\sqrt{\frac{5^4 a^{-3} b^4 c^6}{625 a^5 b^{-2} c^2}}$$

- a. $b^3 c^2 / a^4$ b. bc^2 / a^4
 c. $b^2 c^2 / a^4$ d. $b^2 c^2 / a^2$

6. Four different electronic devices make a beep every 30 minutes, 1 hour, 1 1/2 hour and 1 hour 45 minutes respectively. All the devices beeped together at 12 noon. They will again beep together at:

- a. 12 midnight b. 3 AM
 c. 6 AM d. 9 AM

7. \$1,200 amounts to \$1,632 in 4 years at a certain rate of simple interest. If the rate of interest is increased by 1%, it would amount to how much?

- a. \$1,635 b. \$1,644
 c. \$1,670 d. \$1,680

8. In a shipment of 120 machine parts, 5 percent were defective. In a shipment of 80 machine parts, 10 percent were defective. For the two shipments combined, what percent of the machine parts were defective?

- a. 6.50 % b. 7.00 %
 c. 7.50 % d. 8.00 %

9. The sum of two consecutive whole numbers is 12. If the smaller number is n, then which of the following statements is the correct equation?

- a. $2n = 12$ b. $n + n - 1 = 12$
 c. $2n - n = 12$ d. $n + n + 1 = 12$

10. If $P = 3x - 4y - 8z$, $Q = -10y + 7x + 11z$ and $R = 19z - 6y + 4x$, then $P - Q + R$ is equal to:

- a. $13x - 20y + 16z$
 b. 0
 c. $x + y + z$
 d. $2x - 4y + 3z$

11. A polynomial when divided by $(x - 6)$, gives a quotient $x^2 + 2x - 13$ and leaves a remainder -8 . The polynomial is:
- $x^3 + 4x^2 + 25x - 78$
 - $x^3 - 4x^2 - 25x + 70$
 - $x^3 - 4x^2 - 25x - 70$
 - $x^3 + 4x^2 - 25x + 78$
12. In an isosceles triangle, each of the two equal sides is 3 cm more than twice the base. If the perimeter of the triangle is 31 cm, then find the sides of the triangle:
- 7 cm, 12 cm, 12 cm
 - 5 cm, 13 cm, 13 cm
 - 10 cm, 10.5 cm, 10.5 cm
 - 9 cm, 11 cm, 11 cm
13. The number of boys is more than the number of girls by 12% of the total strength of the class. The ratio of the number of boys to that of the girls is:
- 11: 14
 - 14: 11
 - 25: 28
 - 28: 25
14. The average mark scored by 22 candidates in an examination is 45. The average marks of the first ten are 55 and that of the last eleven is 40. The marks obtained by the 11th candidate are:
- 0
 - 45
 - 50
 - 47.5
15. In which one of the following triangles does the orthocentre lie in the exterior of the triangle?
- $\triangle ABC$, wherein, $\angle A = \angle B = \angle C = 60^\circ$
 - $\triangle PQR$, wherein, $\angle P = 40^\circ$, $\angle Q = 30^\circ$, $\angle R = 110^\circ$
 - $\triangle XYZ$, wherein, $\angle X = 80^\circ$, $\angle Y = 60^\circ$, $\angle Z = 40^\circ$
 - $\triangle DEF$, wherein, $\angle D = 52^\circ$, $\angle E = 90^\circ$, $\angle F = 38^\circ$
16. A variate takes 11 values which are arranged in ascending order of their magnitudes. It is found that the 4th, 6th and 8th observations are 8, 6, and 4 respectively. What is the median of the distribution?
- 4
 - 6
 - 8
 - 10
17. The marbles in a box are taken out and put into three bags in the ratio of 3: 2: 5. If the number of marbles in the box is 150, then find the number of marbles in the bag which contains the most number of marbles:
- 50
 - 75
 - 100
 - 125
18. The common factor of $72x^3y^4z^2$, $120z^3d^4x^4$ and $96y^3z^4d^4$ is:
- $96z^2$
 - $120z^2$
 - $72z^2$
 - $24z^2$
19. The base of a parallelogram is thrice its height, if the area of the parallelogram is 108 m^2 . Find the base and height respectively:
- 18 m, 6 m
 - 4 m, 12 m
 - 12 m, 4 m
 - 6 m, 18 m
20. Vince wants to fence the garden in front of his house on three sides with lengths 20.8 m, 12.5 m and 12.5 m. Find the cost of fencing at the rate of \$125 per m:
- \$3,125
 - \$5,725
 - \$1,145
 - \$4,162
21. Find the value of the following:
 $3^0 \times 4^0 + 2^0 \times 3^0/16^0$
- 0
 - 1
 - 2
 - 1/2

22. A student observed a quadrilateral in which the diagonals are perpendicular to each other and it satisfies all the properties of a rectangle. What type of quadrilateral is it?

- a. Rectangle b. Rhombus
c. Square d. Parallelogram

23. Find the sum of the interior angles of a 15-sided polygon:

- a. 2340° b. 2160°
c. 2520° d. 1990°

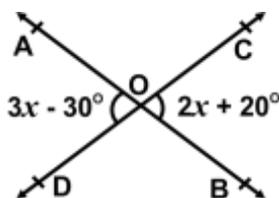
24. Two bells toll at intervals of 60 seconds and 90 seconds, respectively. If they toll together at 10:00 AM, then what is the earliest time at which they toll together?

- a. 10:03 AM b. 10:30 AM
c. 1:00 PM d. 1:03 PM

25. The greatest possible quantity that can be used to measure the quantities 2 L 750 mL, 3 L 500 mL and 4 L 250 mL is _____.

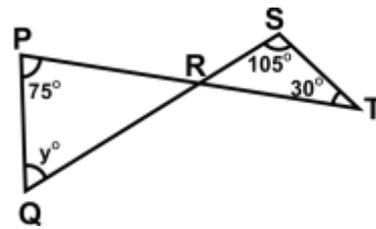
- a. 750 mL b. 500 mL
c. 250 mL d. 125 mL

26. In the given figure, two lines AB and CD intersect each other at O. Find the value of x.



- a. 120° b. 60°
c. 50° d. 70°

27. Look at the image given below. PRT and QRS are straight lines. Find the value of y:



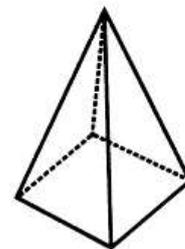
- a. 30° b. 60°
c. 75° d. 80°

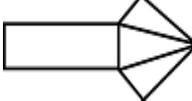
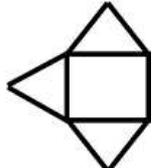
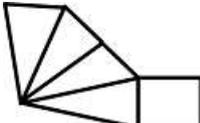
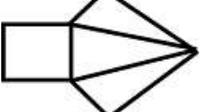
28. The figure shows a circle in a square. Find the total area of the shaded part:



- a. 420 cm^2 b. 392 cm^2
c. 86 cm^2 d. 94 cm^2

29. The figure shows a solid. Which of the following options is the net of the solid?



- a.  b. 
c.  d. 

30. If $9^{1/2} \times 3^m = (27)^m$, then the value of m is:

- a. $\frac{1}{4}$ b. $\frac{1}{5}$
c. $\frac{1}{3}$ d. $\frac{1}{2}$

31. Selin wishes to demonstrate her mathematical magic abilities through

games. She asked her friends to guess the number she was thinking of. She gave them a hint by saying, "If 15 is added to a number in my head, the result is 69; find the number."

- a. 84 b. 69
c. 54 d. 55

32. Amy, Alice, and Milo each gave one even consecutive number, for a total of three consecutive even numbers. If the sum of those three consecutive even numbers is 54, Find the numbers.

- a. 14, 16, 18 b. 16, 18, 20
c. 18, 19, 21 d. 17, 18, 22

33. Alexa has \$x and spends \$6 of it. Find x if twice the amount of money she has left is \$86.

- a. \$45 b. \$49
c. \$54 d. \$58

34. Which of the following alphabetic letters has both a horizontal and vertical line of symmetry?

- a. Y b. P
c. X d. M

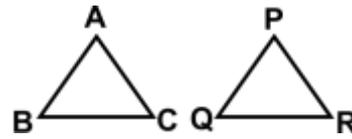
35. What is the order of rotational symmetry of the given figure?



- a. 1 b. 4
c. 6 d. 7

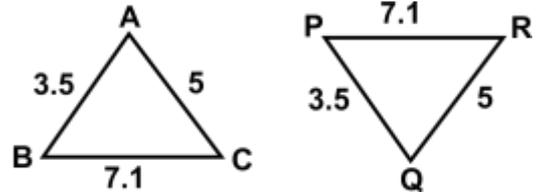
36. Which congruence criterion do you use in the following?

Given $AC = PR$
 $AB = PQ$
 $BC = QR$
So, $\triangle ABC \cong \triangle PQR$



- a. SSS b. ASA
c. SAS d. RHS

37. In the given figure, lengths of the sides of the triangles are given. Which pair of triangle are congruent?



- a. $\triangle ABC \cong \triangle PQR$
b. $\triangle BCA \cong \triangle PQR$
c. $\triangle ABC \cong \triangle QPR$
d. $\triangle BCA \cong \triangle PQR$

38. Feder works as a fruit vendor. He has a basket with three different types of fruits totaling $58\frac{3}{9}$ kg. If $73\frac{9}{9}$ kg are apples, $19\frac{6}{6}$ kg are kiwis, and the rest are strawberries. How much do the strawberries in the basket weigh?

- a. $120\frac{45}{45}$ kg b. $145\frac{18}{18}$ kg
c. $317\frac{12}{12}$ kg d. $532\frac{23}{23}$ kg

39. A car is travelling at $202\frac{5}{5}$ km/hr on average. How far will it travel in $15\frac{2}{2}$ hours?

- a. 200 km b. 303 km
c. 410 km d. 562 km

40. Find the area of right angled triangle whose hypotenuse is 15 cm and one of the sides is 12 cm.

- a. 25 cm^2 b. 35 cm^2
c. 54 cm^2 d. 63 cm^2

Achievers' Section (Each Question is 2 Marks)

41. A shopkeeper sells an article at a loss of $12\frac{1}{2}\%$. Had he sold it for Rs. 51.80 more, he would have earned a profit of 6%. The cost price of the article is:

- a. \$280 b. \$300
c. \$380 d. \$400

42. Rocky works as a rickshaw puller and earns \$80 one day. He spent $\$68\frac{1}{5}$ of his earnings on tea and snacks, $\$51\frac{1}{2}$ on food, and $\$22\frac{1}{5}$ on rickshaw repairs. How much money did he save that day?

- a. $\$29\frac{1}{2}$ b. $\$62\frac{1}{3}$
c. $\$73\frac{1}{2}$ d. $\$79\frac{1}{2}$

43. The present ages of Albert and his father are in the ratio 2: 5 respectively. Four years hence the ratio of their ages becomes 5: 11 respectively. What was the father's age five years ago?

- a. 40 years b. 45 years
c. 30 years d. 35 years

44. The cost price of 20 articles is the same as selling price of x articles. If the profit is 25%, then the value of x is:

- a. 15 b. 16
c. 18 d. 25

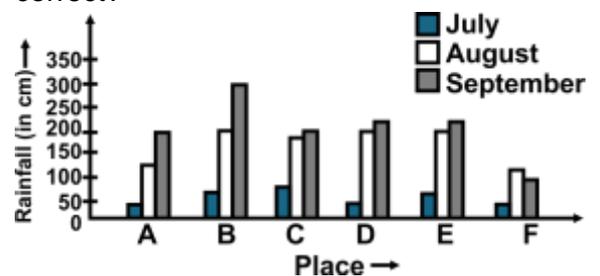
45. D, E and F are the midpoints of BC, CA and AB of $\triangle ABC$. If AD and BE intersect in G, then $AG + BG + CG$ is equal to:

- a. $AD = BE = CF$
b. $\frac{2}{3}(AD + BE + CF)$
c. $\frac{3}{2}(AD + BE + CF)$
d. $\frac{1}{3}(AD + BE + CF)$

46. The L.C.M. of two numbers is 12 times their H.C.F. The sum of the H.C.F and L.C.M. is 403. If one of the numbers is 93, then what is the other number?

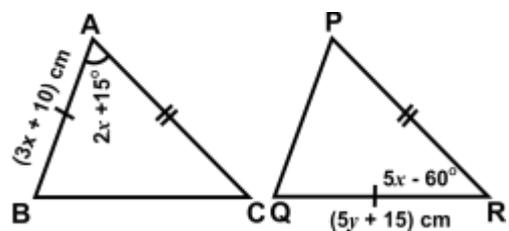
- a. 124 b. 128
c. 134 d. 138

47. The following bar graph shows the rainfall at selected locations in certain months. Which of the following statements is correct?



- a. July rainfall exceeds August rainfall by 100 cm in each location
b. September rainfall exceeds August rainfall by 50 cm in each location
c. July rainfall is lower than August rainfall in each location
d. None of these

48. In the given figure $\triangle BAC = \triangle QRP$ by SAS criterion of congruence. Find the value of x and y respectively.



- a. 20, 14 b. 24, 18
c. 25, 14 d. 29, 19

49. Adren is a good worker who earns a good living, earning \$16000 per month. She spends $\frac{1}{4}$ of his income on food, $\frac{3}{10}$ of the remainder on house rent, and $\frac{5}{21}$ of the remainder on children's

education. How much money does she have left?

- a. \$5490
- b. \$6218
- c. \$6400
- d. \$7200

50. A rectangular courtyard is 75 metres long and 32 metres wide. Determine the cost of levelling it at \$3 per m².

- a. \$3200
- b. \$6543
- c. \$7200
- d. \$8100

Answer Key

- | | | | | | | | | | | | | | |
|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|
| 1. | a | 2. | d | 3. | d | 4. | a | 5. | a | 6. | d | 7. | d |
| 8. | b | 9. | d | 10. | b | 11. | b | 12. | b | 13. | b | 14. | a |
| 15. | b | 16. | b | 17. | b | 18. | d | 19. | a | 20. | b | 21. | c |
| 22. | c | 23. | a | 24. | a | 25. | c | 26. | c | 27. | b | 28. | b |
| 29. | c | 30. | d | 31. | c | 32. | b | 33. | b | 34. | c | 35. | c |
| 36. | a | 37. | c | 38. | b | 39. | b | 40. | c | 41. | a | 42. | c |
| 43. | d | 44. | b | 45. | b | 46. | a | 47. | c | 48. | c | 49. | c |
| 50. | c | | | | | | | | | | | | |