



Grade 6



CREST Mathematics Olympiad (CMO)

Sample Paper

Pattern and Marking Scheme

| Grade | Topic/Section | No. of Questions | Marks per Question | Total Marks |
|--------------------|-----------------------|------------------|--------------------|-------------|
| Grade 6 | Practical Mathematics | 40 | 1 | 40 |
| | Achiever's Section | 10 | 2 | 20 |
| Grand Total | | | 50 | 60 |

The total duration of the exam is 60 minutes.

Syllabus

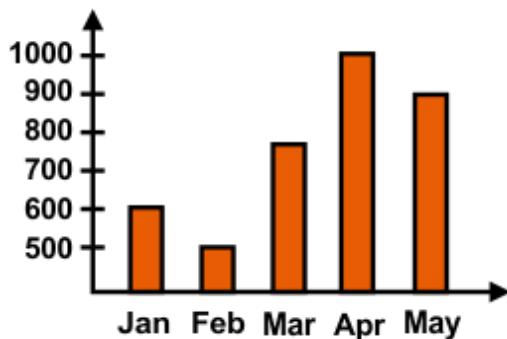
Section 1: Knowing Our Numbers, Whole Numbers, Playing with Numbers, Basic Geometrical Ideas, Understanding Elementary Shapes, Integers, Fractions, Decimals, Data Handling, Mensuration, Algebra, Ratio And Proportion, Symmetry, Practical Geometry.

Achievers Section: Higher Order Thinking Questions - Syllabus as per Section 1

For more details, visit <https://www.crestolympiads.com/math-olympiad-cmo>

Practical Mathematics (Each Question is 1 Mark)

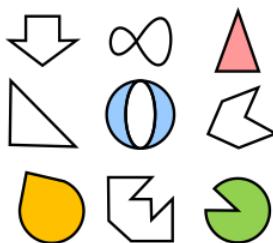
1. The bar graph shows the sale of chocolates in 5 months from January to May: What is the total sale of chocolates from January to May?



2. Fill in the blank:
A quadrilateral with only one pair of opposite side parallel is called a _____

- a. Parallelogram
 - b. Trapezium
 - c. Rhombus
 - d. Kite

3. How many of the following figures have exactly one line of symmetry?



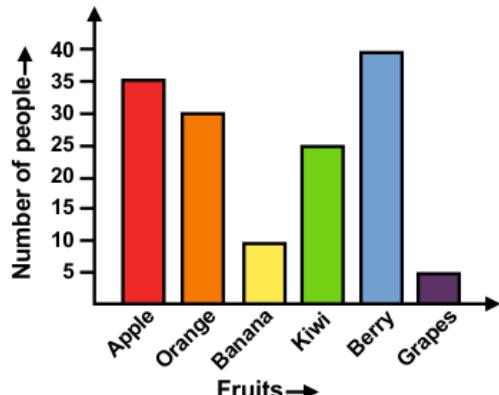
4. What will come in place of "?"

| | | | | | |
|-----|----|----|----|----|----|
| 15 | 17 | 13 | 16 | 11 | 14 |
| 102 | 19 | 94 | 18 | ? | 17 |

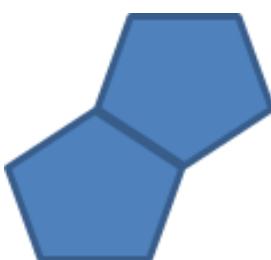
5. The portion of a circle bounded by a chord and the arc subtended by the chord is called _____ of a circle.

- a. Sector
 - b. Segment
 - c. Radius
 - d. Diameter

6. The given graph shows the fruit preferences of people.
How many more people prefer oranges over bananas?



- a. 5
b. 10
c. 15
d. 20
7. Two regular pentagons of side 5 cm are joined together as shown in the figure. Find the perimeter of the new figure:



- a. 35 cm
b. 40 cm
c. 45 cm
d. 50 cm
8. How many lines of symmetry are there in an equilateral triangle?

- a. 0
b. 1
c. 2
d. 3
9. The ratio of two numbers is 3:7. If the sum of the numbers is 700, find the two numbers.

- a. 210, 490
b. 270, 490
c. 110, 490
d. 110, 650
10. Find the value of x:
 $11 : 13 :: x : 26$

- a. 20
b. 21
c. 22
d. 24
11. A car covers a distance of 39.25 km using 2.5 L of petrol. How much distance will it cover in 1 L of petrol?

- a. 12.4 km
b. 15.7 km
c. 17.5 km
d. 19.25 km

12. What is the product of $8/11$ and the additive inverse of $44/2$?

- a. -16
- b. 28
- c. -34
- d. 16

13. Fill in the blank:

The number of diagonals in a heptagon is _____.

- a. 12
- b. 7
- c. 9
- d. 14

14. Choose the correct option:

The HCF and LCM of two numbers are 84 and 21, respectively. If the ratio of the two numbers is 1:4, then the larger of the two numbers is:

- a. 12
- b. 48
- c. 84
- d. 108

15. A borrows \$800 at the rate of 12% per annum simple interest and B borrows \$910 at the rate of 10% per annum simple interest. In how many years will their debts be equal?

- a. 18 years
- b. 20 years
- c. 22 years
- d. 24 years

16. The average marks in Mathematics for 5 students were found to be 50. Later it was discovered that in the case of one student, the mark 48 was misread as 84. The correct average is:

- a. 40.2
- b. 40.8
- c. 42.8
- d. 48.2

17. Which of the following statements is true?

- a. The product of two negative integers is negative
- b. The sum of a negative integer and a positive integer is always positive
- c. The product of two positive and two negative integers is positive
- d. The product of any number of negative integers is negative

18. Which of the following statements is true?

- a. If there is a drop of 4°C from -10°C , the result is -6°C
- b. 525 m above sea level is denoted as -525 m
- c. $|-5| - |-3| = |-8|$
- d. The absolute value of an integer is never less than the integer itself

19. George travels from place A to place B and Peter travels from place B to place A. George travels one-third of the distance and Peter travels one-fourth of the distance. The distance travelled by George is one kilometre more than the distance travelled by Peter. What is the distance between place A and place B? (In km)

- a. 9
- b. 10
- c. 12
- d. 18

20. If A, B, C, and D represent x , \div , $+$ and $-$, respectively, then find the value of:
90B3A5D3C9

- a. 12
- b. 24
- c. 156
- d. 30

21. What must be added to 203 to get a number whose digits are reversed from the given number?

- a. 100
- b. 99
- c. 89
- d. 77

22. Which of the following is not a pair of twin primes between 10 and 40?

- a. (11, 13)
- b. (21, 23)
- c. (17, 19)
- d. (29, 31)

23. If 64 and 48 are divisible by 4 then what is the difference of the given numbers so that it is divisible by 4?

- a. 12
- b. 18
- c. 20
- d. 16

24. Which of the following will not be the statement for the algebraic expression $20z$?

- a. The product of z and 20
- b. z multiplied by 20
- c. 20 times z
- d. 20 divided by z

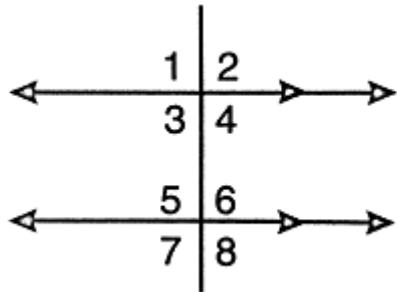
25. It takes 90 minutes to wash 20 vehicles at a car wash. At this rate, how many minutes does it take to wash 5 vehicles?

- a. 22 minutes
- b. 14 minutes
- c. $22 \frac{1}{2}$ minutes
- d. $7 \frac{1}{2}$ minutes

26. In a triangle PQR, if $PQ + QR = 10$ cm, $QR + PR = 12$ cm and $PR + PQ = 16$ cm, then the perimeter of the triangle is:

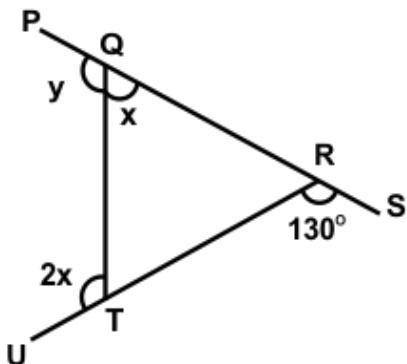
- a. 19 cm
- b. 17 cm
- c. 28 cm
- d. 22 cm

- 27.** If the sum of two numbers is 55 and the H.C.F. and L.C.M. of these numbers are 5 and 120 respectively, then what is the sum of the reciprocals of these numbers?
- a. $55/601$ b. $601/55$
 c. $11/120$ d. $120/11$
- 28.** $1/10$ of a rod is coloured red, $1/20$ orange, $1/30$ yellow, $1/40$ green, $1/50$ blue, $1/60$ black and the rest violet. If the length of the violet portion is 12.08 m, then what is the length of the rod?
- a. 16 m b. 18 m
 c. 20 m d. 30 m
- 29.** The present age of a father is 3 years more than 3 times the age of his son. Three years hence, the father's age will be 10 years more than twice the age of the son. The father's present age is:
- a. 33 years b. 39 years
 c. 45 years d. 40 years
- 30.** Two numbers are such that the ratio between them is 3:4. If each is increased by 9, the ratio between the new numbers formed is 6:7. Find the original numbers.
- a. 12, 14 b. 18, 21
 c. 24, 28 d. 9, 12
- 31.** Annual incomes of 'A' and 'B' are in the ratio 4:5, respectively. If the income of 'A' increases by 25% and that of 'B' increases by 20%, then what is the new ratio of their incomes respectively?
- a. 5:8 b. 4:7
 c. 5:6 d. 6:5
- 32.** In the given figure $\angle 1 = x$ and $\angle 7 = 2x/3$. Find the value of $\angle 5$.



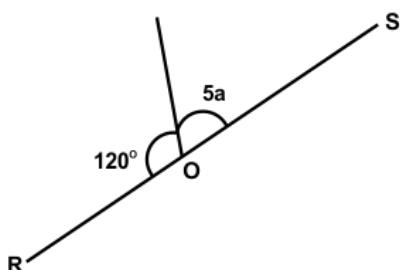
- a. 36° b. 72°
 c. 108° d. 144°

33. In the figure, PQRS and RTU are straight lines. The value of 'y' is:



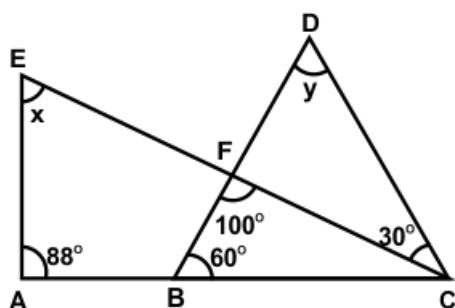
- a. 100°
- b. 130°
- c. 115°
- d. 145°

34. Find the value of 'a' in the below figure, given that ROS is a straight line.



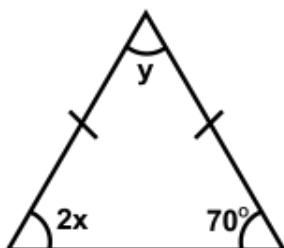
- a. 60°
- b. 48°
- c. 12°
- d. 6°

35. In the figure shown below, ABC and EFC are straight lines. Find the value of $x + y$.



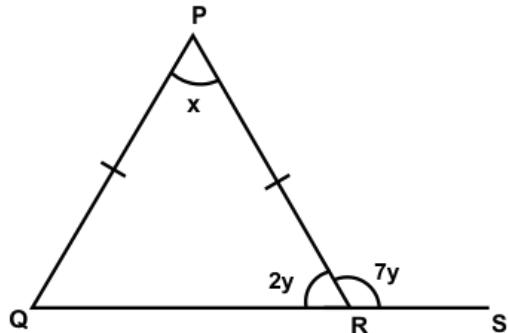
- a. 120°
- b. 130°
- c. 138°
- d. 142°

36. Consider an isosceles triangle as shown in the figure below. Find the value of $x + y$.



- a. 62°
- b. 70°
- c. 75°
- d. 83°

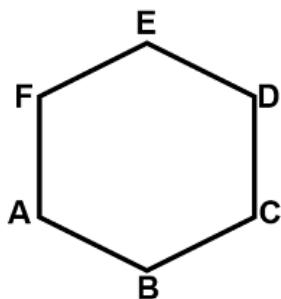
37. PQR is an isosceles triangle and QRS is a straight line. The value of x is:



- a. 80°
- b. 95°
- c. 100°
- d. 110°

38. A polygon is entirely made up of straight lines only. A hexagon ABCDEF is a six-sided polygon.

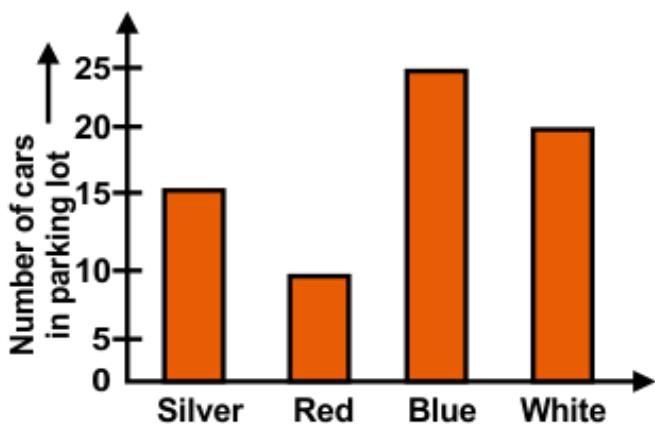
How many diagonals are there in the hexagon?



- a. 7
- b. 8
- c. 9
- d. 10

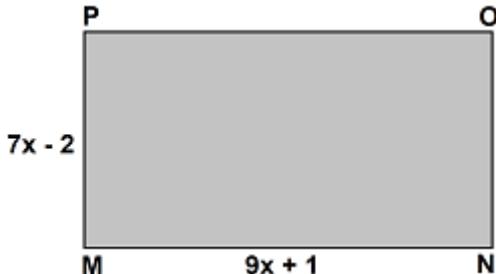
39. Study the bar graph and match the lists:

| List I | | List II | |
|--------|--|---------|------|
| P. | Total number of cars in the parking lot is | 1. | Blue |
| Q. | Number of cars which are blue in colour is | 2. | 25 |
| R. | The least common colour among the cars is | 3. | 70 |
| S. | The most common colour among the cars is | 4. | Red |



- a. P-2, Q-3, R-1, S-4
 b. P-1, Q-2, R-3, S-4
 c. P-4, Q-3, R-2, S-1
 d. P-3, Q-2, R-4, S-1

40. In the given rectangle MNOP, if length is decreased by $3x$, then find the new perimeter.



- a. $(32x - 2)$ units
 b. $(30x - 2)$ units
 c. $(26x - 2)$ units
 d. $(28x - 2)$ units

Achiever's Section (Each Question is 2 Marks)

41. Find m and n in the given ratios:

$$48 : 384 = m : 784 = 53 : n$$

- a. $m = 35, n = 88$
 b. $m = 98, n = 424$
 c. $m = 26, n = 153$
 d. $m = 82, n = 584$

42. Choose the correct option:

In a factory men, women and children were employed in the ratio 8:5:1 to finish a job and their individual wages were in the ratio 5:2:3. Total daily wages of all amount to 318 cents. Find the total daily wages paid to each category:

- a. 240 cents, 60 cents, 18 cents
 b. 210 cents, 70 cents, 38 cents
 c. 190 cents, 95 cents, 33 cents
 d. 190 cents, 90 cents, 33 cents

43. Due to an increase of 30% in the price of a colour TV, the sale is reduced by 40%, so what will be the percentage change in income?

- a. 10% increase
 b. 10% decrease
 c. 35% decrease
 d. 22% decrease

44. Match the following:

| Column A | | Column B | |
|----------|--------------------------------------|----------|----------|
| a. | $[2^9 \times 2^{12}] \div 2^5$ | p. | 2^{10} |
| b. | $[2^{19} \times 2^{14}] \div 2^{20}$ | q. | 2^{13} |
| c. | $[2^{17} \times 2^{18}] \div 2^{16}$ | r. | 2^{16} |
| d. | $[2^6 \times 2^{12}] \div 2^8$ | s. | 2^{19} |

- a. (a) - (r); (b) - (p); (c) - (s); (d) - (q)
 b. (a) - (r); (b) - (s); (c) - (q); (d) - (p)
 c. (a) - (r); (b) - (q); (c) - (s); (d) - (p)
 d. (a) - (p); (b) - (q); (c) - (s); (d) - (r)

45. Simplify:

$$[\{(2/3)^2 \times (256/625)^{1/2}\}^{-1/2} \div ((4/3)^{-2})^3] \times (1/0.1)^{-1} = \underline{\hspace{2cm}}.$$

- a. $4^5/3^7$
b. $4^5/3^6$
c. $4^6/3^5$
d. $3^5/4^6$

46. If $63.3605 = 6A + 3/B + 3C + 6/D + 5E$, then what is the value of $4A + 7B + 6C + D + 3E$.

- a. 47.603
b. 4.7603
c. 147.6003
d. 47.6003

47. Consider the following quotients:

- I. 368.39 divided by 17
II. 170.50 divided by 62
III. 875.65 divided by 83

Their correct sequence in decreasing order is:

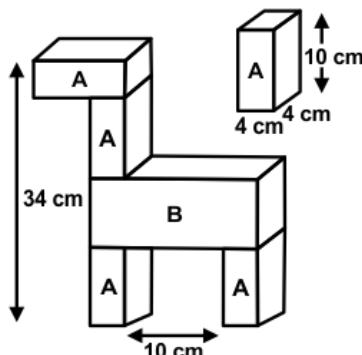
- a. I, III, II
b. II, I, III
c. II, III, I
d. III, I, II

48. Simplify:

$$(87.4 \times 6.5 - 0.1) / (28.4 \times 9.8 + 5.68)$$

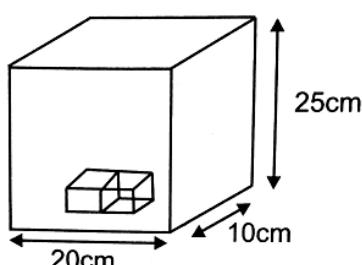
- a. 1/2
b. 3
c. 2
d. 4

49. A few blocks of wood are used to make the shape of a giraffe as shown below. What is the volume of wood used to make the giraffe?



- a. 640 cm^2
b. 1260 cm^2
c. 1360 cm^2
d. 1400 cm^2

50. A tank with two identical metal cubes in it was filled with water to the brim. When the cubes are removed the water level dropped to 80% of its height. The edge of one cube is:



a. 15 cm
c. 10 cm

b. 25 cm
d. 8 cm

Answer Key

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