CBSE Sample Question Paper Term 1

Class – VIII Session -2021-22

SUBJECT- MATHEMATICS 041 - TEST - 01

Class 08 - Mathematics

Time Allowed: 1 hour and 30 minutes **Maximum Marks: 40**

General Instructions:

1. The question paper contains 50 questions
2. Attempt any 40 questions.
3. There is no negative marking.

1. $1 \times \frac{12}{13}$ = _____. **[1]**

   a) $\frac{12}{13}$ b) 1

   c) 0 d) 12

2. Find the multiplicative inverse of -23. **[1]**

   a) $\frac{-1}{23}$ b) 23

   c) 24 d) -23

3. Name the property under multiplication used in $\frac{-1}{3} \times (-3) = (-3) \times \frac{-1}{3} = 1$. **[1]**

   a) Associative property b) Distributive property

   c) Reciprocal and commutative under multiplication d) Multiplicative identity

4. The numerical expression $\frac{3}{8} + (\frac{-5}{7}) = \frac{-19}{56}$ shows that **[1]**

   a) addition of rational numbers is not commutative b) rational numbers are not closed under addition

   c) rational numbers are closed under multiplication d) rational numbers are closed under addition

5. The numbers _____ and _____ are their own reciprocals. **[1]**

   a) 2, -2 b) 1, -1

   c) 0 d) 1

6. $-\frac{2}{5} \times \left(-\frac{5}{2}\right)$ = _____. **[1]**

   a) 5 b) 2

   c) $\frac{2}{5}$ d) 1

7. The reciprocal of 0 is: **[1]**

   a) -1 b) Not defined

   c) 1 d) 0

8. Solve: 8x = 4 **[1]**

   a) 32 b) 2

   c) none of these d) $\frac{1}{2}$

9. $\sqrt{80}$ is _____ number. **[1]**

   a) negative b) irrational

   c) none of these d) rational

10. The number of boys and girls in a class is in the ratio 7:5. The number of boys is 8 more than the number of girls. What is the total class strength? **[1]**

    a) 45 b) 0

    c) 40 d) 48

11. One of the two digits of a two-digit number is three times the other digit. If you interchange the digits of this two-digit number and add the resulting number to the original number, you get 88. What is the original number? **[1]**

    a) 52 b) 71

    c) 35 d) 26

12. Solve 0.25(4m - 3) = 0.05(10 - 9) **[1]**

    a) 0.6 b) 0.1

    c) 0.12 d) 0.8

13. Solve: $\frac{2x}{3}$ = 12 **[1]**

    a) 30 b) 18

    c) 6 d) 12

14. Solve: $\frac{2x}{3} + 1 = \frac{7x}{15} + 3$ **[1]**

    a) 6 b) 5

    c) 3 d) 10

15. Solve: $\frac{5y}{2}$ = 15 **[1]**

    a) 3 b) 6

    c) 4 d) 5

16. Solve: 12x = 132 **[1]**

    a) none of these b) 13

    c) 11 d) 12

17. Two adjacent angles of a parallelogram have equal measure. Find the measurement of each of the angles of the parallelogram. **[1]**

    a) 60° b) none of these

    c) 30° d) 90°

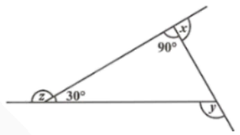
18. Find the measure of each exterior angle of a regular polygon of 30^0 sides. **[1]**

a) none of these
b) 30^o
c) 12^o
d) 36^o

19. In a square ABCD, the diagonals meet at point O. The △AOB is **[1]**

a) scalene right triangle
b) isosceles right triangle
c) isosceles triangle but not right triangle
d) equilateral triangle

20. Find x + z: **[1]**



a) 180
b) 240
c) none of these
d) 210

21. State the name of a regular polygon of 8 sides. **[1]**

a) none of these
b) hexagon
c) heptagon
d) octagon

22. What is the sum of the measures of the angles of a convex quadrilateral? **[1]**

a) 90^o
b) 45^o
c) 180°
d) 360^o

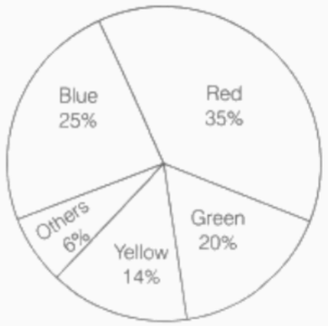
23. How many sides are there in a rectangle? **[1]**

a) 6
b) 5
c) 3
d) 4

24. How many vertices are present in a heptagon? **[1]**

a) None of these
b) 8
c) 7
d) 6

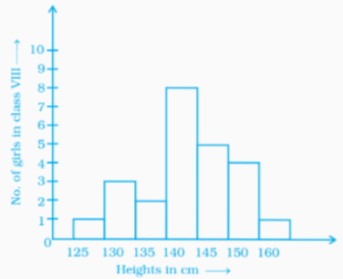
25. Students of a class voted for their favourite colour and a pie chart was prepared based on the data collected. **[1]**



If 400 students voted in all, then how many did vote 'Others' colour as their favourite?

a) 24
b) 6
c) 20
d) 40

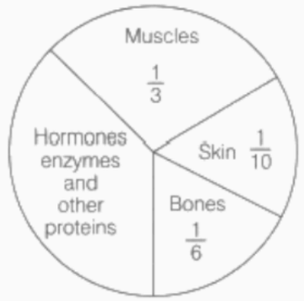
26. **[1]**



Observe the histogram given above. The number of girls having height 145 cm and above is:

a) 5
b) 17
c) 10
d) 19

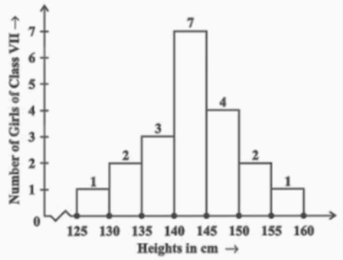
27. The following pie chart represents the distribution of proteins in parts of human body. **[1]**



What is the central angle of the sector (in the above pie chart) representing skin and bones together?

a) 90°
b) 60°
c) 36°
d) 96°

28. How many girls have a height of 145 cms and more? **[1]**



a) 5
b) 7
c) 4
d) 6

29. A coin is tossed two times. The number of possible outcomes is **[1]**

a) 2
b) 4
c) 1
d) 3

30. In a frequency distribution with classes 0-10, 10-20 etc., the size of the class intervals is 10. The lower limit of fourth class is: **[1]**

a) 40
b) 20

c) 30 d) 50

31. A bag contains 3 red and 2 blue marbles. A marble is drawn at random. What is the probability of drawing a red marble? **[1]**

a) None of these b) $\frac{1}{5}$

c) $\frac{3}{5}$ d) $\frac{2}{5}$

32. Without doing any calculation, find the numbers which are surely perfect squares. **[1]**

A. 1521
B. 1567
C. 1698
D. 1303

a) C b) A

c) B d) D

33. Which of the following is not a perfect square number? **[1]**

A. 2400
B. 2401
C. 2500
D. none of these

a) C b) D

c) B d) A

34. In the interval 35-45, 45 is called **[1]**

a) Upper limit b) Lower limit

c) Frequency d) Range

35. How many natural numbers lie between 18^2 and 19^2? **[1]**

a) 37 b) 30

c) 36 d) 35

36. What will be the number of zeros in the square of 4000? **[1]**

a) none of these b) 6

c) 2 d) 4

37. What is the cube of the triple of m? **[1]**

a) None of these b) $27m^3$

c) $9m^3$ d) $3m^3$

38. A natural number is said to be a perfect cube if it is the cube of some _____. **[1]**

a) natural number b) cuboid number

c) square number d) cube number

39. If $(1728)^{1/3} = 2x + 2$, then the value of x is **[1]**

a) 6 b) 5

c) 8 d) 7

40. A group of students were given the assignment to collect different types of leaves. The group collected 625 types of leaves. Represent the number of leaves collected in the form of exponential expression with its base being indivisible. **[1]**

a) 5^3 b) 5^5

c) 5^2 d) 5^4

41. a^{-m} is the multiplicative inverse of _____. **[1]**

a) None of these b) a^{2m}

c) a^{-m} d) a^m

42. Evaluate: -9^3 **[1]**

a) -729 b) 81

c) 729 d) 30

43. Find the value of m for which $5^m \div 5^{-3} = 5^5$. **[1]**

a) 4 b) 2

c) 3 d) 5

44. For any two non-zero rational numbers x and y, $x^4 \div y^4$ is equal to **[1]**

a) $(x \div y)^0$ b) $(x \div y)^4$

c) $(x \div y)^1$ d) $(x \div y)^8$

45. $\left(\frac{3}{4}\right)^5 \div \left(\frac{5}{3}\right)^5$ is equal to **[1]**

a) $\left(\frac{3}{4} \div \frac{5}{3}\right)^{10}$ b) $\left(\frac{3}{4} \div \frac{5}{3}\right)^1$

c) $\left(\frac{3}{4} \div \frac{5}{3}\right)^5$ d) $\left(\frac{3}{4} \div \frac{5}{3}\right)^0$

46. The usual form of 100a + b + 10c is **[1]**

a) acb b) bac

c) cab d) abc

47. If 5A + 25 is equal to B2, then the value of A + B is **[1]**

a) 8 b) 15

c) 7 d) 10

48. Find the values of the letters in following : **[1]**

$$\begin{array}{r} AB \\ \times\ 3 \\ \hline CAB \end{array}$$

a) A = 1, B = 0, C = 1 b) A = 5, B = 0, C = 1

c) A = 5, B = 5, C = 5 d) A = 5, B = 0, C = 5

49. If the division N ÷ 5 leaves a remainder of 4, what might be the one's digit of N? **[1]**

a) 7 b) Either 2 or 7

c) 5 d) Either 4 or 9

50. If 21y5 is a multiple of 9, where y is a digit, what is the value of y? **[1]**

a) 2 b) 4

c) 3 d) 1

Solution

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Class 08 - Mathematics

1. **(a)** $\frac{12}{13}$
   Explanation: The answer is $\frac{12}{13}$ as any number multiplied by 1 gives the same number as a product as 1 is the multiplicative identity of rational numbers.
2. **(a)** $\frac{-1}{23}$
   Explanation: The multiplicative inverse or reciprocal of any rational number is given by $\frac{1}{number}$, here the rational number is -23, so its multiplicative inverse will be $\frac{1}{-23}$.
3. **(c)** Reciprocal and commutative under multiplication
   Explanation: The property used here is both reciprocal and commutativity under multiplication. Reciprocal because both (-3) and its reciprocal $\frac{-1}{3}$ are multiplied. Commutative under multiplication because it follows the rule: a × b = b × a
4. **(d)** rational numbers are closed under addition
   Explanation: In the given expression the addition of two rational numbers is given and the result obtained is also a rational number.
5. **(b)** 1, -1
   Explanation: The answer is 1, -1
   Because the reciprocal of 1 is $\frac{1}{1}$=1 and reciprocal of -1 is $\frac{1}{-1}$= —1
6. **(d)** 1
   Explanation: $\frac{-2}{5} \times (\frac{-5}{2})$
   = $\frac{10}{10}$
   = 1
7. **(b)** Not defined
   Explanation: The reciprocal of 0 is not defined. $\left[\because \frac{1}{0} \text{ is not defined }\right]$
8. **(d)** $\frac{1}{2}$
   Explanation: 8x = 4
   divide both sieds by 4
   $\frac{8x}{4} = \frac{4}{4}$
   2x = 1
   by transposing
   x = $\frac{1}{2}$
9. **(b)** irrational
   Explanation: $\sqrt{80} = \sqrt{(2 \times 2 \times 2 \times 2 \times 5)}$
   = $2 \times 2\sqrt{5}$
   = $4\sqrt{5}$ which is an irrational number
10. **(d)** 48
    Explanation: let the number of boys and girls = x
    ratio = 7 : 5
    boys =7x
    girls = 5x
    According to question,
    7x = 5x + 8
    By transposing,
    7x - 5x = 8
    2x = 8

$x = \frac{8}{2}$
$x = 4$
now the number of boys = 7x = 28
the number of girls = 5x = 20
total students = 28 + 20 = 48

11. **(d)** 26
Explanation: let the unit place be = 2
tens place = 3x
number = 30x + x = 31x
when interchange the digit
number = 10x + 3x = 13x
Now according to question
31x + 13x = 88
or, 44x = 88
or, $x = \frac{88}{44}$
or, x = 2
The number will be = 13x = 26

12. **(d)** 0.8
Explanation: 0.25(4m - 3) = 0.05(10 - 9)
or, m - 0.75 = 0.05
or, m = 0.8

13. **(b)** 18
Explanation: $\frac{2x}{3} = 12$
$2x = 12 \times 3$
2x = 36
$x = \frac{36}{2}$
x = 18

14. **(d)** 10
Explanation: $\frac{2x}{3} + 1 = \frac{7x}{15} + 3$
by transposing
or, $\frac{2x}{3} - \frac{7x}{15} = 3 - 1$
or, $\frac{10x-7x}{15} = 2$
or, 3x = 30
or, x = 10

15. **(b)** 6
Explanation: $\frac{5y}{2} = 15$
by transposing
$5y = 15 \times 2$
5y = 30
$y = \frac{30}{5}$
y = 6

16. **(c)** 11
Explanation: 12x = 132
by transposing
$x = \frac{132}{12}$
x = 11

17. **(d)** 90°
Explanation: $x + x = 180$(Let an angle be x)
$2x = 180$
$x = 90^\circ$

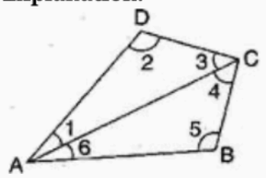
18. **(c)** 12^o
Explanation: Exterior angle= $\frac{360^0}{number-of-sides}$
$n = \frac{360^0}{30} = 12^o$

19. **(b)** isosceles right triangle
Explanation: We know that diagonal of a square bisect each other at 90^0.
Therefore, $\triangle$AOB is an isosceles right triangle.

20. **(b)** 240
Explanation: $z + 30 = 180^o$ (Linear pair)
$z = 180 - 30 = 150^o$
$x + 90 = 180^o$ (Linear pair)
$x = 180 - 90 = 90^o$
Therefore, $x + z = 90 + 150 = 240^o$

21. **(d)** octagon
Explanation: An octagon is an eight-sided polygon or 8-gon.

22. **(d)** 360^o
Explanation:



Let ABCD is a convex quadrilateral, then we draw a diagonal AC which divides the quadrilateral into two triangles.
$\angle A + \angle B + \angle C + \angle D$
$= \angle 1 + \angle 6 + \angle 5 + \angle 4 + \angle 3 + \angle 2$
$= \angle(1 + 2 + 3) + \angle(4 + 5 + 6)$
We are aware that the total sum of the interior angles of any triangle will be 180^o and a quadrilateral is made up of two triangles
Thus, the sum of the interior angles of both the triangles are $180 + 180 = 360^\circ$
So,the sum of the measures of the angles of a convex quadrilateral is 360^o

23. **(d)** 4
Explanation: A rectangle is a four-sided flat shape where every angle is a right angle (90^o). Each internal angle is 90^o opposite sides are parallel and of equal length (so it is a Parallelogram).

24. **(c)** 7
Explanation: A heptagon is a seven-sided polygon. It is also sometimes called a septagon.

25. **(a)** 24
Explanation: If total number of votes = 400
Then, number of votes in favour of 'Others' = 6% of 400 = $\frac{6}{100} \times 400 = \frac{3}{50} \times 400 = 24$

26. **(c)** 10
Explanation: From the given histogram, it is clear that the number of girls having height equal to 145 cm or above are 10.

27. **(d)** 96°
Explanation: The portion representing skin and bones together = $\frac{1}{10} + \frac{1}{6} = \frac{3+5}{30} = \frac{8}{30}$
Central angle of the sector representing skin and bones together $= \frac{8}{30} \times 360^\circ = 96^\circ$

28. **(b)** 7
Explanation: Number of girls have a height of 145 cms and more = 4 + 2 +1= 7

29. **(b)** 4
Explanation: When a coin is tossed two times the possible outcomes are
HH – Two heads
HT – First head and second tail
TH – First tail and second tail
TT – Two tails
Therefore,
The sample space is {HH, HT, TH, TT} = 4
Hence, the number of possible outcomes is 4.

30. **(c)** 30
Explanation: Given classes are 0-10 and 10-20.
As, the class of given classes is 10, so the next classes will be 20-30 and 30-40.
As, the fourth class is 30-40.
Hence, the lower limit of fourth class is 30.

31. **(c)** $\frac{3}{5}$
Explanation: Total number of marbles = 5
Red marbles = 3
Probability of getting a red marble = $\frac{3}{5}$

32. **(b)** A
Explanation: The answer is 1521 as the other numbers are 1567, 1698 and 1303 which cannot be a perfect square as a number cannot be a perfect square if it ends with 2, 3, 7, 8.

33. **(d)** A
Explanation: The answer is 2400

34. **(a)** Upper limit
Explanation: Upper limit

35. **(c)** 36
Explanation: Here is a solution using a sequence approach:
$18^2 = 324$
$19^2 = 361$
The natural numbers between 18^2 and 19^2 are the numbers in the sequence:
325, 326,..., 359, 360
Using the formula for the number of terms, n in and A.P. sequence:
last term = first term + (n -1) × common difference, we get:
360 = 325 + (n - 1) × 1
⇒ 360 - 325 = n -1
⇒ 35 = n - 1
⇒ n = 35 +1 = 36.
Therefore, 36 natural numbers lie between 18 squared and 19 squared.
or The natural numbers lie between n squared and (n+1) squared = 2n
hence, natural numbers lie between 18 squared and 19 squared = 2×18 = 36

36. **(b)** 6
Explanation: The number of zeroes in the square of a number is given by 2m, where m is the number of zeroes in the number which is to be squared. Here m =3, 2m = 2 × 3 = 6 zeroes will be present in 4000^2

37. **(b)** $27m^3$
Explanation: The triple of m = 3m
The cube of the triple of m = 3m × 3m × 3m
$= (3m)^3$
$= 27m^3$

38. **(a)** natural number
Explanation: The answer is the natural number. The cube of a natural number is always a natural number.

39. **(b)** 5
Explanation: $(1728)^{1/3}$ = 2x + 2
$\sqrt[3]{1728}$ = 2x + 2
12 = 2x + 2
12 - 2 = 2x
10 = 2x
$\frac{10}{2}$ = x
x = 5

40. **(d)** 5^4
Explanation: Factorisation of 625 is 5, 5, 5, 5
i.e $625 = 5 \times 5 \times 5 \times 5 = 5^4$

41. **(d)** a^m
Explanation: Multiplicative inverse means reciprocal. The multiplicative inverse of $a^{-m} = a^m$

42. **(a)** -729
Explanation: -9^3
$= -9 \times -9 \times -9$
= -729

43. **(b)** 2
Explanation: $= 5^m \div 5^3 = 5^5$
$= 5^m = 5^5 \times 5^3$
$5^m = 5^{5-3}$
$5^m = 5^2$
Hence, m = 2

44. **(b)** $(x \div y)^4$
Explanation: Using laws of exponents, $\frac{a^m}{b^m} = \left(\frac{a}{b}\right)^m = (a \div b)^m$ [∵ a and b are non-zero integers]
Similarly, $x^4 \div y^4 = \left(\frac{x}{y}\right)^4 = (x \div y)^4$

45. **(c)** $\left(\frac{3}{4} \div \frac{5}{3}\right)^5$
Explanation: Using law of exponents, $a^m \div b^m = (a \div b)^m$ [∵ a and b are non-zero integers]
$\therefore \quad \left(\frac{3}{4}\right)^5 \div \left(\frac{5}{3}\right)^5 = \left(\frac{3}{4} \div \frac{5}{3}\right)^5$

46. **(a)** acb
Explanation: In general, the usual form of 100a + b + 10c is
acb = 100 × a + 10 × c + 1 × b = 100a + 10c + b
or after rearranging 100a + b + 10c = acb

47. **(b)** 15
Explanation: If 5A + 25 = B2
here A + 5 = 2 i.e. two digit number. so, A = 7 and 1 carrya
57 + 25 = 82 so, B = 8
hence A + B = 7 + 8
= 15

48. **(b)** A = 5, B = 0, C = 1
Explanation: When 3is multiplied with B it gives a number whose onesplace is B again. So, B must be 5 or 0.
Let B = 5
First step: 5 × 3 = 15
1 will be carried forward. Therefore, (A × 3) + 1 = CA. This is not possible for any number.

Therefore, value of B has to be 0 only.
If B = 0, then there will be no carry. So we get A × 3 = CA.
When a number is multiplied with 3, its ones place should be the number itself. That is possible only for A = 0 or 5. But A cannot be 0 as it has to be two digit numbers. Therefore, the value of A is 5. Thus we get the following

$$\begin{array}{r} 50 \\ \times 3 \\ \hline 150 \end{array}$$

The value of A, B and C is 5, 0 and 1 respectively.

49. **(d)** Either 4 or 9
Explanation: We know for a number to be divisible by 5 should have 0 or 5 at ones place. If the remainder is 4 than the ones digit of N must be either 0 + 4 = 4 or 5 + 4 = 9. Therefore, the answer is either 4 or 9.

50. **(d)** 1
Explanation: If a number is a multiple of 9, the sum of its digits must be divisible by 9.
Sum of digits of 21y5 = 2 + 1 + y + 5 = 8 + y.
Hence, 8 + y should be a multiple of 9.
Next multiple of 9 is 9. So, 8 + y = 9
So, the value of y = 1.