

Class VIII Session 2023-24
Subject - Maths
Sample Question Paper - 2

Time Allowed: 3 hours

Maximum Marks: 80

1. Find: $\frac{-4}{5} \times \frac{3}{7} \times \frac{15}{16} \times \left(\frac{-14}{9}\right)$ [1]
a) 2
b) 0
c) 1
d) $\frac{1}{2}$
2. The numerical expression $\frac{3}{8} + \left(\frac{-5}{7}\right) = \frac{-19}{56}$ 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
3. If $\frac{5x}{3} - 4 = \frac{2x}{5}$, then the numerical value of $2x - 7$ is [1]
a) $\frac{19}{13}$
b) $\frac{13}{19}$
c) $-\frac{13}{19}$
d) 0
4. In which quadrilateral only one diagonal is bisected? [1]
a) Rectangle
b) Rhombus
c) Kite
d) Square
5. The value of $\sqrt{248 + \sqrt{52 + \sqrt{144}}}$ is [1]
a) 13
b) 16
c) 14
d) 12
6. Which of the following numbers is not a perfect cube? [1]
a) 343
b) 567
c) 125
d) 216
7. Find the prime factorisation of 6859. [1]
a) 6^8
b) 34^7
c) 23^3
d) 19^3
8. The list price of a frock is Rs 220. A discount of 20% is announced on sales. What is the sale price? [1]
a) Rs 122
b) Rs 154
c) Rs 176
d) Rs 144
9. The difference of compounded and simple interest on any amount at 4% annual rate of interest for 2 years ₹ is 4. [1]

Find the principal?

a) ₹2500

b) ₹2000

c) ₹2400

d) ₹2600

10. Find C.I. on Rs 20,000 for 3 years at 20% per annum compounded annually. [1]

a) Rs 14,000

b) Rs 15,000

c) None of these

d) Rs 14,560

11. Find the volume of a cuboid whose length is 8 cm, width is 3 cm and height is 5 cm. [1]

a) 120cm^3

b) 120 cm

c) 120 cm^2

d) 125 cm^3

12. The outer dimensions of a water tank are 7 meters, 6 meters and 5 meters. A quart of paint covers about 15 m^2 . How many quarts do you need to paint the outer walls of the tank? [1]

a) 8.6 quarts

b) 7.6 quarts

c) 9.6 quarts

d) 10.6 quarts

13. If the volume of a cube is divided by its surface area, the result is 2.5 cm. What is the length of the edge of the cube? [1]

a) 15 cm

b) 12 cm

c) 20 cm

d) 10 cm

14. If x be any integer different from zero and m be any positive integer, then x^{-m} is equal to [1]

a) $\frac{1}{x^m}$

b) $\frac{-1}{x^m}$

c) x^m

d) $-x^m$

15. If x be any non-zero integer, then x^{-1} is equal to [1]

a) $-x$

b) $\frac{1}{x}$

c) x

d) $\frac{-1}{x}$

16. The value of $(0.000064)^{\frac{5}{6}}$ is [1]

a) $\frac{32}{100000}$

b) $\frac{16}{10000}$

c) $\frac{32}{10000}$

d) $\frac{16}{100000}$

17. If 32 men can reap a field in 15 days, in how many days can 20 men reap the same field? [1]

a) 32 days

b) 24 days

c) 28 days

d) 20 days

18. In a camp, there is enough flour for 300 persons for 42 days. How long will the flour last if 20 more persons join the camp? [1]

a) 40 days

b) 51 days

c) $39\frac{3}{8}$ days

d) $42\frac{1}{4}$ days

19. A graph that displays data that changes continuously over periods of time is [1]

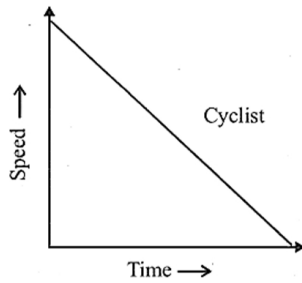
a) Histogram

b) Line graph

c) Pie chart

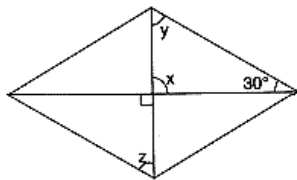
d) Bar graph

20. The given graph shows the progress of a cyclist during a ride. [1]



Which of the following describe the rider's progress over the period of time.

- a) Cyclist moves with uniform speed. b) Speed of cyclist increases for a short time period and then increases very slowly.
- c) As time passes the speed of cyclist decreases steadily. d) As time passes speed of cyclist increases.
21. Let a, b, c be the three rational numbers where $a = \frac{2}{3}$, $b = \frac{4}{5}$ and $c = \frac{-5}{6}$ then verify that $a + (b + c) = (a + b) + c$ [2]
(Associative property of addition).
22. Solve the equation and check your result: $5x + 9 = 5 + 3x$ [2]
23. Consider the parallelogram. Find the degree values of the unknowns x, y, z. [2]

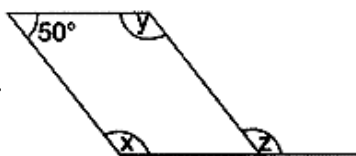


24. Find the square root of 529 by Division method. [2]
25. Using prime factorisation, find the cube root of 2197. [2]
26. Kritika is following this recipe for bread. She realises her sister used most of sugar syrup for her breakfast. Kritika has only $\frac{1}{6}$ cup of syrup, so she decides to make a small size of bread. How much of each ingredient shall she use? [2]

Bread recipe

- 1 cup quick cooking oats
- 2 cups bread flour
- $\frac{1}{3}$ cup sugar syrup
- 1 tablespoon cooking oil
- $1\frac{1}{3}$ cups water
- 3 tablespoons yeast
- 1 teaspoon salt.

27. Divide as directed: $5(2x + 1) (3x + 5) \div (2x + 1)$ [2]
28. Solve: $4(3p + 2) - 5(6p - 1) = 2(p - 8) - 6(7p - 4)$ [3]
29. Consider the parallelogram. Find the degree values of the unknowns x, y, and z. [3]



30. A box contains 19 cards having numbers 1, 2, 3, 19. A card is drawn from the box. What is the probability [3]

a) ₹ 1800

b) ₹ 400

c) ₹ 1500

d) ₹ 1600

43. Her total saving in the shopping is ₹ 800.

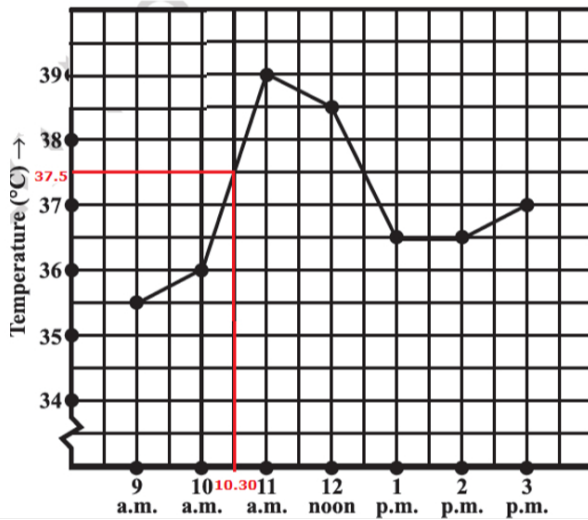
a) True

b) False

Question No. 44 to 48 are based on the given text. Read the text carefully and answer the questions:

[5]

Once Rohan was admitted in hospital due to heavy fever and body pain. Doctor did test for typhoid fever. The results revealed the positive for typhoid.



The doctor was not still sure about the illness. He advised the nurses to record the patient's temperature hourly. The record of temp has been plotted as per above graph.

44. What was the patient's temperature at 1 p.m.?

a) 36.5 °C

b) 37 °C

c) 38 °C

d) 39 °C

45. What was the patient's temperature at 10.30 am?

a) 36.5 °C

b) 39 °C

c) 38 °C

d) 37.5 °C

46. From which time temp raised very high?

a) 10 am

b) 11am

c) 9 am

d) 12 pm

47. The highest temp was _____ °C.

48. After 11 am temperature stated coming down.

a) True

b) False

Solution

1.

(d) $\frac{1}{2}$

Explanation: $\frac{-4}{5} \times \frac{3}{7} \times \frac{15}{16} \times \left(\frac{-14}{9}\right)$
 $= \frac{-12}{35} \times \frac{-210}{144}$
 $= \frac{6}{12}$
 $= \frac{1}{2}$

2.

(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.

3.

(c) $-\frac{13}{19}$

Explanation: $\frac{5x}{3} - 4 = \frac{2x}{5}$

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

$$\frac{25x - 6x}{15} = 4$$

$$19x = 15 \times 4$$

$$x = \frac{60}{19}$$

hence,

$$2x - 7$$

$$= 2 \times \frac{60}{19} - 7$$

$$= \frac{120}{19} - 7$$

$$= \frac{120 - 133}{19}$$

$$= -\frac{13}{19}$$

4.

(c) Kite

Explanation: A quadrilateral is a kite if and only if any one of the following condition is true:

- Two disjoint pairs of adjacent sides are equal
- One diagonal is the perpendicular bisector of other diagonal
- one diagonal is a line of symmetry
- one diagonal bisects a pair of opposite angles.

5.

(b) 16

Explanation: We have, $\sqrt{248 + \sqrt{52 + \sqrt{144}}}$

$$= \sqrt{248 + \sqrt{52 + 12}} \text{ [}\therefore \text{ square root of } 144 = 12\text{]}$$

$$= \sqrt{248 + \sqrt{64}}$$

$$= \sqrt{248 + 8} \text{ [}\therefore \text{ square root of } 64 = 8\text{]}$$

$$= \sqrt{256} = 16 \text{ [}\therefore \text{ square root of } 256 = 16\text{]}$$

6.

(b) 567

Explanation: $567 = 3 \times 3 \times 3 \times 3 \times 7$

Clearly, 567 is not a perfect cube, because in grouping, the factors of equal factors, we are left with two factors 3×7 .

7.

(d) 19^3



Explanation: $6859 = 19 \times 19 \times 19$

$$= 19^3$$

8.

(c) Rs 176

Explanation: The list price of frock = Rs 220

$$\text{Discount} = 220 \times \frac{20}{100}$$

$$= \text{Rs } 44$$

$$\text{Sale price} = \text{Rs}(220 - 44)$$

$$= \text{Rs } 176$$

9. (a) ₹2500

Explanation: Difference between C.I. and S.I. for 2 years.

$$d = P \left(\frac{r}{100} \right)^2$$

$$4 = P \left(\frac{4}{100} \right)^2$$

$$4 = P \times \left(\frac{1}{25} \right)^2$$

$$P = 4 \times 625$$

$$= ₹2500$$

10.

(d) Rs 14,560

Explanation: C.I. = $P \left(1 + \frac{r}{100} \right)^3 - P$

$$= 20,000 \left(1 + \frac{20}{100} \right)^3 - 20,000$$

$$= 20,000 \left(\frac{6}{5} \right)^3 - 20,000$$

$$= 34,560 - 20,000$$

$$= \text{Rs } 14,560$$

11. (a) 120cm^3

Explanation: Length of the cuboid = 8 cm

Width of the cuboid = 3 cm

Height of the cuboid = 5 cm

Volume of a cuboid = length \times breadth \times height

$$\text{Therefore, Volume of the given cuboid} = 8 \times 3 \times 5 = 120 \text{ cm}^3$$

12. (a) 8.6 quarts

Explanation: length = 7m, breadth = 6m and height = 5m

Surface area of four walls = $2 \times \text{height}(\text{length} + \text{breadth})$

$$S = 2 \times 5(7 + 6)$$

$$S = 10(13) = 10 \times 13 = 130\text{m}^2$$

A quart of paint covers 15m^2

$$15\text{m}^2 = 1 \text{ Quart of paint}$$

$$1\text{m}^2 = \frac{1}{15} \text{ quart of paint}$$

$$130 \text{ m}^2 = \frac{1}{15} \times 130 = 8.6 \text{ quart of paint.}$$

8.6 quarts of paint is needed.

13. (a) 15 cm

Explanation: let the side of cube be x cm

Volume of cube = (side)³

$$V = (x)^3 = x^3$$

Surface area of cube = $6(\text{side})^2$

$$S = 6(x)^2 = 6x^2$$

according to question,

$$\frac{\text{volume}}{\text{surface area}} = 2.5\text{cm}$$

$$\frac{x^3}{6x^2} = 2.5$$

$$\frac{x}{6} = 2.5$$

$$x = 2.5 \times 6 = 15 \text{ cm}$$

length of cube is 15 cm.

14. (a) $\frac{1}{x^m}$

Explanation: Using law of exponents, $a^{-m} = \frac{1}{a^m}$

Similarly, $x^{-m} = \frac{1}{x^m}$ [\because a is non-zero integer]

15.

(b) $\frac{1}{x}$

Explanation: Using law of exponents, $a^{-m} = \frac{1}{a^m}$ [\because a is non-zero integer]

Similarly, $x^{-1} = \frac{1}{x}$

16. (a) $\frac{32}{100000}$

Explanation: $(0.000064)^{\frac{5}{6}} = \left(\frac{64}{1000000}\right)^{\frac{5}{6}}$

$$= \left[\left\{ \left(\frac{2}{10} \right)^6 \right\}^{1/6} \right]^5 = \left(\frac{2}{10} \right)^5 = \frac{32}{100000}$$

17.

(b) 24 days

Explanation: This is a case of inverse proportion as with a decrease in the number of men the number of days needed to reap the field will increase.

In inverse proportion, the value of constant is given by $x \times y$

$$32 \times 15 = 20 \times a \text{ (where a is the number of days needed to reap the field)}$$

$$480 = 20 \times a$$

$$\frac{480}{20} = a$$

$$24 \text{ days} = a$$

18.

(c) $39\frac{3}{8}$ days

Explanation: If number of persons increase, then flour consume more. So, this is the case of inverse proportion.

Number of persons	300	320
Number of days	42	x

Then,

$$300 \times 42 = 320 \times x$$

$$x = \frac{300 \times 42}{320}$$

$$x = 39\frac{3}{8} \text{ days.}$$

19.

(b) Line graph

Explanation: Line graph is an important way to represent and compare the data which varies continuously. A line graph displays the relation between two varying quantities. In a line graph, we connect all the points by a line segment while in bar graph and histogram, we use rectangles of uniform width.

20.

(c) As time passes the speed of cyclist decreases steadily.

Explanation: As time passes, the speed of cyclist decreases steadily.

21. Taking L.H.S = $a + (b + c)$

$$= \frac{2}{3} + \left[\frac{4}{5} + \left(\frac{-5}{6} \right) \right]$$

$$= \frac{2}{3} + \left[\frac{24-25}{30} \right]$$

$$= \frac{2}{3} + \left(\frac{-1}{30} \right)$$

$$= \frac{20-1}{30} = \frac{19}{30}$$

Now taking R.H.S. = $(a + b) + c$

$$= \left(\frac{2}{3} + \frac{4}{5}\right) + \left(\frac{-5}{6}\right)$$

$$= \left(\frac{10+12}{15}\right) + \left(\frac{-5}{6}\right)$$

$$= \frac{22}{15} - \frac{5}{6} = \frac{44-25}{30} = \frac{19}{30}$$

$$\text{So, } \frac{2}{3} + \left[\frac{4}{5} + \left(\frac{-5}{6}\right)\right] = \left(\frac{2}{3} + \frac{4}{5}\right) + \left(\frac{-5}{6}\right)$$

Hence, verified.

22. $5x + 9 = 5 + 3x$

$5x - 3x = 5 - 9$... [Transposing $3x$ to L.H.S. and 9 to R.H.S.]

$$\therefore 2x = -4$$

$$\therefore x = -\frac{4}{2} \dots \text{[Dividing both sides by 2]}$$

$\therefore x = -2$ this is the required solution.

Verification

L.H.S. = $5(-2) + 9 = -10 + 9 = -1$

R.H.S. = $5 + 3(-2) = 5 - 6 = -1$

Therefore, L.H.S = R.H.S

23. $x = 90^\circ$ [Vertically opposite angles]

$x + y + 30^\circ = 180^\circ$ [Sum of angles of a triangle is equal to 180°]

$\Rightarrow 90^\circ + y + 30^\circ = 180^\circ$

$\Rightarrow 120^\circ + y = 180^\circ$

$\Rightarrow y = 180^\circ - 120^\circ = 60^\circ$

$y = z = 60^\circ$ [Vertically opposite angles]

$$24. \begin{array}{r|l} 23 & \\ \hline 2 & \overline{5 \ 29} \\ & - 4 \\ \hline 43 & \overline{1 \ 29} \\ & - 1 \ 29 \\ \hline & 0 \end{array}$$

Therefore, $\sqrt{529} = 23$

25. We have, 2197

$$\begin{array}{r|l} 13 & 2197 \\ \hline 13 & 169 \\ \hline 13 & 13 \\ \hline & 1 \end{array}$$

Now, $2197 = 13 \times 13 \times 13$

$$\therefore \sqrt[3]{2197} = 13$$

26. According to the information given, After used of most of sugar syrup for her breakfast, the remaining sugar is $\frac{1}{6}$ cup of sugar syrup. Thus, it means $1 - \frac{1}{6} = \frac{5}{6}$ has been used. She need $\frac{1}{3}$ cup of sugar syrup for one piece of bread. So, new quantity of ingredients will be in proportion of $\frac{1}{2}$.

Now, the bread recipe will look like

$\frac{1}{2}$ cup quick-cooking oats

1 cups bread flour

$\frac{1}{6}$ cup sugar syrup

$\frac{1}{2}$ tablespoon cooking oil

$\frac{2}{3}$ cups water

$\frac{3}{2}$ tablespoons yeast

$\frac{1}{2}$ teaspoon salt.

27. $5(2x + 1) (3x + 5) \div (2x + 1)$

$$= \frac{5(2x+1)(3x+5)}{2x+1}$$

$$= 5(3x + 5)$$

28. Given, $4(3p + 2) - 5(6p - 1) = 2(p - 8) - 6(7p - 4)$

$$\Rightarrow 12p + 8 - 30p + 5 = 2p - 16 - 42p + 24$$

$$\Rightarrow -18p + 13 = -40p + 8$$

$$\Rightarrow -18p + 40p = 8 - 13 \text{ [transposing } -40p \text{ to LHS and } 13 \text{ to RHS]}$$

$$\Rightarrow 22p = -5$$

$$\Rightarrow \frac{22p}{22} = \frac{-5}{22} \text{ [dividing both sides by } 22]$$

$$\therefore p = \frac{-5}{22}$$

29. $x + 50^\circ = 180^\circ$ [Conjoint angles are equal]

$$\Rightarrow x = 180^\circ - 50^\circ = 130^\circ$$

$$y = x = 130^\circ \text{ [Opposite angles of a parallelogram are equal]}$$

$$180^\circ - z = 50^\circ$$

$$\Rightarrow z = 180^\circ - 50^\circ = 130^\circ \text{ [Sum of angles on a straight line is equal to two right angles]}$$

30. The out comes are = 1, 2, 3, 19

Total number of outcomes = 19

Numbers divisible by 5 = 5, 10, 15

$$\text{Probability of an event} = \frac{\text{Number of outcomes that make an event}}{\text{Total number of outcomes of the experiment}}$$

The probability of number on the card is divisible by 5 = $\frac{3}{19}$

31.

8	$\begin{array}{r} 80 \\ \hline \overline{64} \overline{12} \\ - 64 \\ \hline 12 \\ - 0 \\ \hline 12 \end{array}$
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This shows that $80^2 < 6412$

Next perfect square is $81^2 = 6561$

Hence, the number to be added is $81^2 - 6412 = 6561 - 6412 = 149$

Therefore, the perfect square so obtained is $6412 + 149 = 6561$

Hence, $\sqrt{6561} = 81$.

32. Let the number added is x ,

$$(2m^2 - 3mn + 3n^2) + x = (5m^2 + 2mn + 7n^2)$$

$$x = (5m^2 + 2mn + 7n^2) - (2m^2 - 3mn + 3n^2)$$

$$x = 5m^2 + 2mn + 7n^2 - 2m^2 + 3mn - 3n^2$$

$$x = 3m^2 + 5mn + 4n^2$$

So, the number is $3m^2 + 5mn + 4n^2$.

33. $4c(-a + b + c) - [3a(a + b + c) - 2b(a - b + c)]$

$$= -4ac + 4bc + 4c^2 - [3a^2 + 3ab + 3ac - 2ab + 2b^2 - 2bc]$$

$$= -4ac + 4bc + 4c^2 - [3a^2 + 2b^2 + 3ab - 2bc + 3ac - 2ab]$$

$$= -4ac + 4bc + 4c^2 - [3a^2 + 2b^2 + ab + 3ac - 2bc]$$

$$= -4ac + 4bc + 4c^2 - 3a^2 - 2b^2 - ab - 3ac + 2bc$$

$$= -3a^2 - 2b^2 + 4c^2 - ab + 4bc + 2bc - 4ac - 3ac$$

$$= -3a^2 - 2b^2 + 4c^2 - ab + 6bc - 7ac$$

34. Radius of the cylindrical bottle = $\frac{\text{diameter of the bottle}}{2}$

$$= \frac{6}{2} = 3 \text{ cm}$$

Height of the bottle = 15 cm

We know that volume of a cylinder = area of the base \times height

$$\text{So volume of the bottle} = \pi r^2 \times h$$

$$= 3.14 \times 3 \times 3 \times 15 = 423.9 \text{ cm}^3$$

$$\text{Approximate volume of the bottle} = 424 \text{ cm}^3$$

$$35. 6^{2x} \div 6^{-4} = 36 = 6^2$$

$$6^{2x} \div 6^{-4} = 6^2$$

$$6^{2x+4} = 6^2$$

$$2x + 4 = 2$$

$$2x = 2 - 4$$

$$2x = -2$$

$$x = -1$$

36. i. Winter season got the most votes.

ii. Central angle of winter sector

$$= \frac{\text{Number of people who vote for winter season}}{\text{Total number of people}}$$

$$= \frac{150}{360} = \frac{5}{12} \text{ of } 360^\circ = 150^\circ$$

Central angle of summer sector

$$= \frac{\text{Number of people who vote for summer season}}{\text{Total number of people}}$$

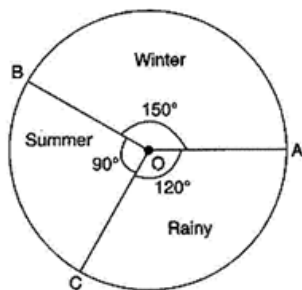
$$= \frac{90}{360} = \frac{1}{4} \text{ of } 360^\circ = 90^\circ$$

Central angle of rainy sector

$$= \frac{\text{Number of people who vote for rainy season}}{\text{Total number of people}}$$

$$= \frac{120}{360} = \frac{1}{3} \text{ of } 360^\circ = 120^\circ$$

iii. Pie Chart



Season	People who voted for it	In fraction	fractions of 360°
Winter	150	$\frac{5}{12}$	$\frac{5}{12}$ of $360^\circ = 150^\circ$
Summer	90	$\frac{1}{4}$	$\frac{1}{4}$ of $360^\circ = 90^\circ$
Rainy	120	$\frac{1}{3}$	$\frac{1}{3}$ of $360^\circ = 120^\circ$

37. Total surface area of the suitcase

$$= 2 (80 \times 48 + 48 \times 24 + 24 \times 80)$$

$$= 2 (3840 + 1152 + 1920)$$

$$= 2 (6912)$$

$$= 13824 \text{ cm}^2$$

\therefore Length of trapaulin required to cover 1 suitcase

$$= \frac{\text{Total Surface area of the suitcase}}{\text{width of trapaulin}}$$

$$= \frac{13824}{96}$$

$$= 144 \text{ cm}$$

\therefore Length of trapaulin required to cover 100 such suitcase

$$= 144 \times 100 \text{ cm}$$

$$= 14400 \text{ cm}$$

$$= 144 \text{ m}$$

Hence, 144 m of trapaulin is required.

38. The given expression is $6x^2 - 13x + 6$

Here coefficient of $x^2 = 6$, coefficient of $x = -13$ and constant term = 6

So we write the middle term $-13x$ as $-4x, -9x$

Thus we have,

$$\begin{aligned}6x^2 - 13x + 6 &= 6x^2 - 4x - 9x + 6 \\&= 2x(3x - 2) - 3(3x - 2) \\&= (3x - 2)(2x - 3)\end{aligned}$$

39. 1. Sale price

40. (a) ₹ 960

Explanation: ₹ 960

41. (d) 150

Explanation: 150

42. (d) ₹ 1600

Explanation: ₹ 1600

43. (b) False

Explanation: False

44. (a) 36.5 °C

Explanation: 36.5 °C

45. (d) 37.5 °C

Explanation: 37.5 °C

46. (a) 10 am

Explanation: 10 am

47. 1. 39

48. (a) True

Explanation: True