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) $120 cm^3$ 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]**

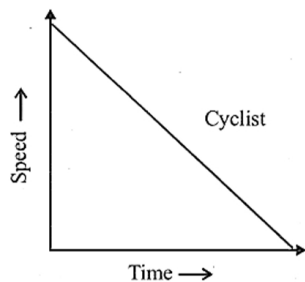a) Histogram   b) Line graph

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   d) As time passes speed of cyclist increases.

       decreases steadily.

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]**
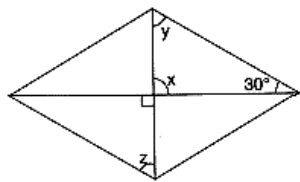
24. Find the square root of 529 by Division method.   **[2]**

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.   **[2]**
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?

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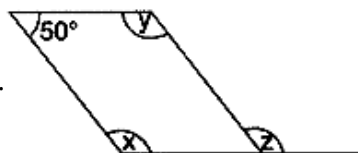
30. A box contains 19 cards having numbers 1, 2, 3, ... 19. A card is drawn from the box. What is the probability   **[3]**

that the number on the card is divisible by 5.

31. Find the least number which must be added to 6412 so as to get a perfect square. Also find the square root of the perfect square so obtained. **[3]**

32. What must be added to $2m^2 - 3mn + 3n^2$ to get $5m^2 + 2mn + 7n^2$? **[3]**

33. Subtract: $3a(a + b + c) - 2b(a - b + c)$ from $4c(-a + b + c)$. **[3]**

34. Rani bought a syrup in a glass bottle. The shape of the bottle is cylindrical with diameter 6cm and height 15cm. Find the volume of the bottle? **[3]**

35. Find x, if $6^{2x} \div 6^{-4} = 36$. **[3]**

36. A group of 360 people were asked to vote for their favourite season from the three seasons rainy, winter and summer. **[4]**

Season	No. of votes
Summer	90
Rainy	120
Winter	150

  i. Which season got the most votes?

  ii. Find the central angle of each sector?

  iii. Draw a pie chart to show this information.

37. A suitcase with measures 80 cm × 48 cm × 24 cm is to be covered with a trapaulin cloth. How many metres of trapaulin of width 96 cm is required to cover 100 such suitcases ? **[4]**

38. Factorize $6x^2 - 13x + 6$ **[4]**

Question No. 39 to 43 are based on the given text. Read the text carefully and answer the questions: **[5]**

Simran went to a shop which gives 20% discount the following items during sale.
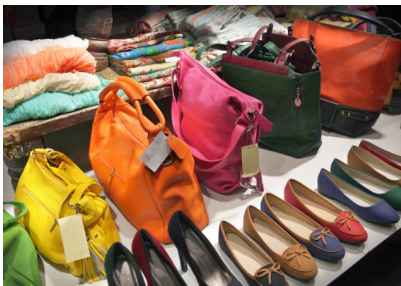
39. Discount is equal to Marked price - _____.

40. Find the sale price of a dress marked at ₹ 1200?

    a) ₹ 960   b) ₹ 1000

    c) ₹ 1200   d) ₹ 900

41. How much discount she will get on pair of shoes marked at ₹ 750.

    a) 250   b) 200

    c) 100   d) 150

42. Find the sale price of a bag marked at ₹ 2000?

a) ₹ 1800   b) ₹ 400

c) ₹ 1500   d) ₹ 1600
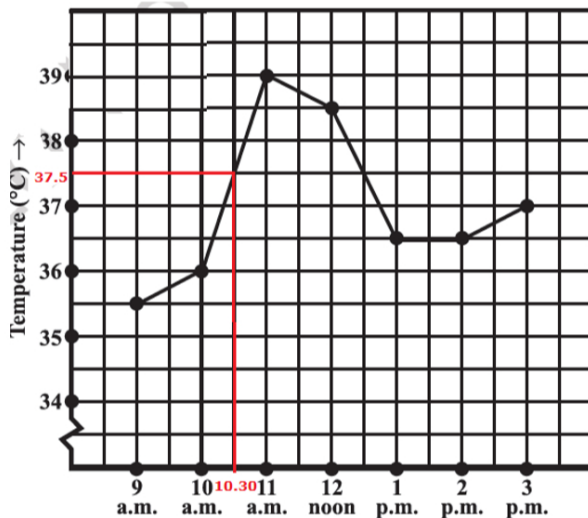
43. Her total saving in the shopping is ₹ 800.

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: $\frac{-4}{5} \times \frac{3}{7} \times \frac{15}{16} \times (\frac{-14}{9})$

$= \frac{-12}{35} \times \frac{-210}{144}$

$= \frac{6}{12}$

$= \frac{1}{2}$

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 × 4

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

hence,

2x - 7

= 2 × $\frac{60}{19}$ - 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, $\sqrt{248 + \sqrt{52 + \sqrt{144}}}$

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

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

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

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

6.

(b) 567

Explanation: 567 = 3 × 3 × 3 × 3 × 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 × 19 × 19

= 19³

8.

(c) Rs 176

Explanation: The list price of frock = Rs 220

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

= Rs 44

Sale price = Rs(220 - 44)

= 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 × 625

= ₹2500

10.

(d) Rs 14,560

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

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

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

= 34,560 - 20,000

= Rs 14,560

11. **(a)** 120cm³

Explanation: Length of the cuboid = 8 cm

Width of the cuboid = 3 cm

Height of the cuboid = 5 cm

Volume of a cuboid = length × breadth × height

Therefore, Volume of the given cuboid = 8 × 3 × 5 = 120 cm³

12. **(a)** 8.6 quarts

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

Surface area of four walls = 2 × height(length + breadth)

S = 2 × 5(7 + 6)

S = 10(13) = 10 × 13 = 130m²

A quart of paint covers 15m²

15m² = 1 Qaurt of paint

1m² = $\frac{1}{15}$ quart of paint

130 m² = $\frac{1}{15} \times 130 = 8.6$ 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 = x³

Surface area of cube = 6(side)²

S = 6(x)² = 6x²

according to question,

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

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

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

x = 2.5 × 6 = 15 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, $x^{-m} = \frac{1}{x^m}$ [∵ a is non-zero integer]

15.

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

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

32 × 15 = 20 × a (where a is the number of days needed to reap the field)

480 = 20 × a

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

24 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 × 42 = 320 × x

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

x = $39\frac{3}{8}$ 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

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

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

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

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

Hence, verified.

22. 5x + 9 = 5 + 3x

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

   ∴ 2x = –4

   ∴ $x = -\frac{4}{2}$ ... [Dividing both sides by 2]

   ∴ 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° [Vertically opposite angles]

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

   ⇒ 90° + y + 30° = 180°

   ⇒ 120° + y = 180°

   ⇒ y = 180° – 120° = 60°

   y = z = 60° [Vertically opposite angles]

24.
```
        23
   2  |  5̄  2̄9̄
      | – 4
  ----+--------
   43 |  1  29
      | –1  29
  ----+--------
      |  0
```

   Therefore, $\sqrt{529} = 23$

25. We have, 2197

```
   13 | 2197
   13 |  169
   13 |   13
      |    1
```

   Now, 2197 = 13 × 13 × 13

   ∴ $\sqrt[3]{2197} = 13$

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) ÷ (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

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

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

   $\Rightarrow$ 22p = - 5

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

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

29. x + 50° = 180° [Conjoint angles are equal]

   $\Rightarrow$ x = 180° – 50° = 130°

   y = x = 130°[Opposite angles of a parallelogram are equal]

   180° – z = 50°

   $\Rightarrow$ z = 180° – 50° = 130° [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

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

   The probability of number on the card is divisible by 5= 3/19

31.

```
          80
        ┌─────────
   8    │ 64 12
        │ - 64
  160   │──────────
        │    12
        │   - 0
        │──────────
        │    12
```

   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 ,

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

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

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

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

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

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 $= \frac{diameter\ of\ the\ bottle}{2}$

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

   Height of the bottle = 15 cm

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

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

   = 3.14 × 3 × 3 × 15 = 423.9 cm^3

   Approximate volume of the bottle = 424 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

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

   $= \dfrac{150}{360} = \dfrac{5}{12}$ of $360^o = 150^o$

   Central angle of summer sector

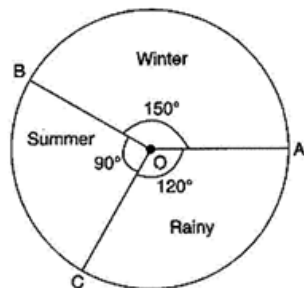 $= \dfrac{Number\ of\ people\ who\ vote\ for\ summer\ season}{Total\ number\ of\ people}$

   $= \dfrac{90}{360} = \dfrac{1}{4}$ of $360^o = 90^o$

   Central angle of rainy sector

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

   $= \dfrac{120}{360} = \dfrac{1}{3}$ of $360^o = 120^o$

   iii. Pie Chart

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

37. Total surface area of the suitcase

   = 2 (80 × 48 + 48 × 24 + 24 × 80)

   = 2 (3840 + 1152 + 1920)

   = 2 (6912)

   = 13824 cm^2

   ∴ Length of trapaulin required to cover 1 suitcase

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

   $= \dfrac{13824}{96}$

   = 144 cm

   ∴ Length of trapaulin required to cover 100 such suitcase

   = 144 × 100 cm

   = 14400 cm

   = 144 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,

$6x^2 – 13x + 6 = 6x^2 – 4x – 9x + 6$

$= 2x(3x – 2) – 3 (3x -2)$

$= (3x – 2)(2x – 3)$

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 ^{o}C

    Explanation: 36.5 ^{o}C

45. **(d)** 37.5 ^{o}C

    Explanation: 37.5 ^{o}C

46. **(a)** 10 am

    Explanation: 10 am

47. 1. 39

48. **(a)** True

    Explanation: True