

Class VIII Session 2025-26

Subject - Mathematics

Sample Question Paper - 1

Time Allowed: 3 hours

Maximum Marks: 80

General Instructions:

All the questions are compulsory.

Section A

1. Choose the correct answers to the questions from the given options. [10]

(a) $\frac{-7}{5} + \left(\frac{2}{-11} + \frac{-13}{25}\right) = \left(\frac{-7}{5} + \frac{2}{-11}\right) + \frac{-13}{25}$ [1]

This property is

a) closure

b) associative

c) identity

d) commutative

(b) Which of the following would end with digit 1? [1]

A. 49^2

B. 23^2

C. 54^2

D. 67^2

a) C

b) A

c) B

d) D

(c) The dimensions of a godwon are 20 m, 25 m and 10 m. In this how many boxes of the dimension 2 m \times 1.25 m \times 1 m can be kept? [1]

a) 8000

b) 6000

c) 2000

d) 4000

(d) Simplify: $\frac{\sqrt{216} + \sqrt{96}}{\sqrt{50^2 - 10^2}}$ [1]

a) 1

b) $\frac{1}{4}$

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

d) 2

(e) A shopkeeper has just enough money to buy 52 cycles worth ₹ 525 each. If each cycle were to cost ₹ 21 more, then number of cycles, he will be able to buy with that amount of money, is _____. [1]

a) 40

b) 20

c) 50

d) 30

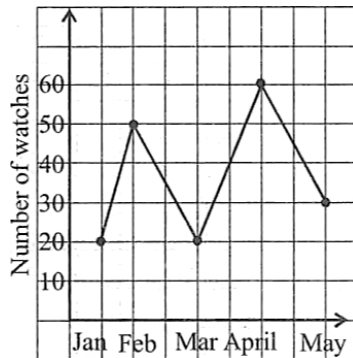
(f) Factors of $a^4 + a^2 + 1$ are: [1]

a) $(a - 1)(a^2 - a + 1)$

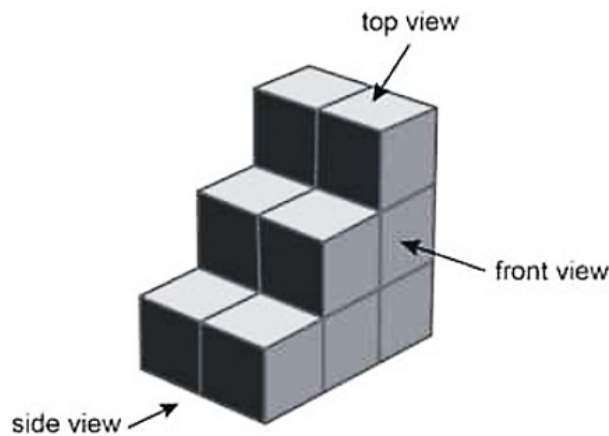
b) $(a - 4)(a + 2)$



- c) $(a^2 + a - 1)(a^2 + a + 2)$ d) $(a^2 + a + 1)(a^2 - a + 1)$
- (g) Find the cubes of $3x$, $5x$ and $7x$. [1]
- a) $4x^3$, $9x^3$, $16x^3$ b) $8x^2$, $27x^2$, $64x^2$
- c) $27x^3$, $125x^3$, $343x^3$ d) $4x^2$, $9x^2$, $16x^2$
- (h) If $\frac{5x-3y}{5y-3x} = \frac{3}{4}$, then value of $\frac{x}{y}$ is [1]
- a) 7 : 9 b) 2 : 9
- c) None of these d) 7 : 2
- (i) The line graph shows the sale of watches in a company. How many watches were sold in those 5 months? [1]



- a) 170 b) 180
- c) 160 d) 175
- (j) Which of the following shows the side view of the arrangement? [1]



Which of the following shows the side view of the arrangement?

- a)  b) 
- c)  d) 

2. Fill in the blanks: [6]
- (a) A pie chart is used to compare a _____ to the whole part. [1]
- (b) The product of two terms with unlike signs is a _____ term. [1]
- (c) A square is a rectangle in which _____ sides are equal. [1]

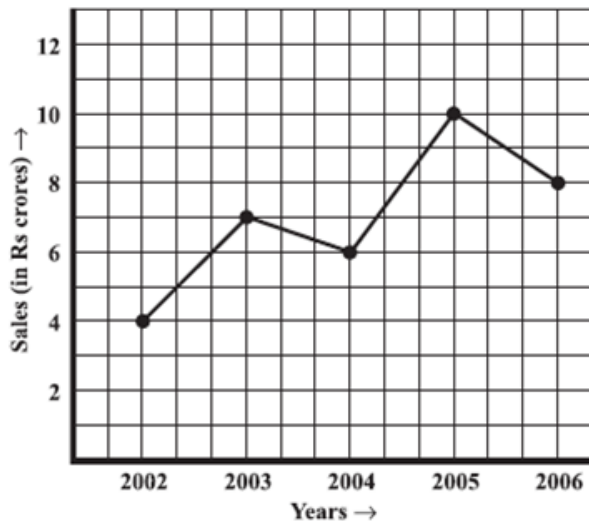
- (d) The product of two rational numbers is always a _____. [1]
- (e) There are _____ perfect squares between 1 and 50. [1]
- (f) If the area of a face of a cube is 10 cm^2 , then the total surface area of the cube is _____ cm^2 . [1]

3. Match the following: [4]

Column A	Column B
1. x and y vary inversely to each other	(a) $x/y = \text{constant}$
2. x and y vary directly with each other	(b) $xy = \text{constant}$
3. Wages (m) and number of hours (n) of work	(c) inverse variation
4. The number of men constructing a road and the time taken to finish it	(d) direct variation

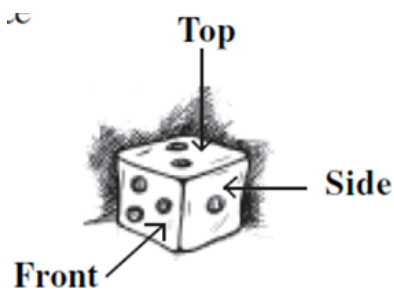
Section B

4. Factorise $y^2 - 2y - 15$. [1]
5. If one side of a cube is 15 m in length, then find its volume. [1]
6. Find the ratio of 3 km to 300 m. [1]
7. The given line graph shows the yearly sales figures for a manufacturing company. In which year was there the greatest difference between the sales as compared to its previous year? [1]



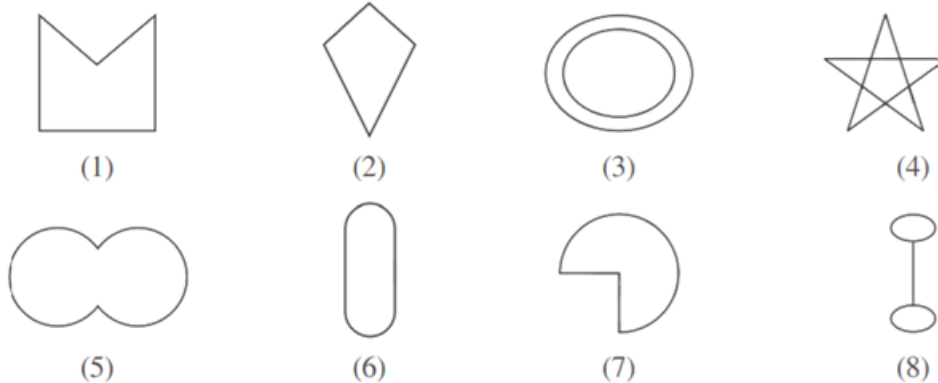
8. Draw the front view, side view and top view of the given object. [1]

A dice



9. Solve: $8x - 7 - 3x = 6x - 2x - 3$ [1]
10. Numbers 1 to 10 are written on ten separate slips (one number on one slip), kept in a box and mixed well. One slip is chosen from the box without looking into it. What is the probability of getting a number 6? [1]
11. Multiply: $-7st$, -1 , $-13st^2$ [1]
12. Given here are some figures. Classify them on the basis of the Concave polygon. [1]





13. Name the property used in $-\frac{7}{5} \times 0 = 0$?

[1]

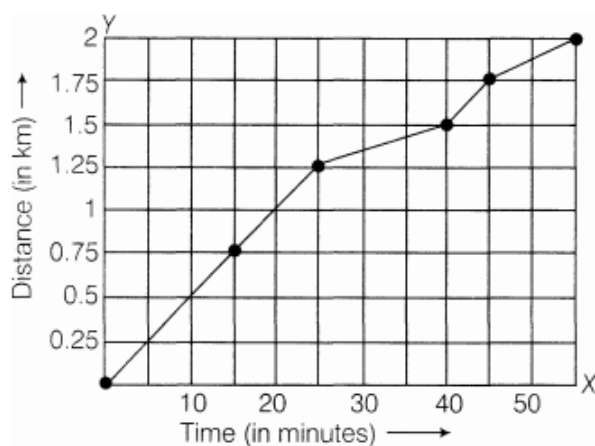
Section C

14. By repeated subtraction of odd numbers starting from 1 to find whether the following number are perfect square or not ? If the number is a perfect square then find its square root 90. [2]
15. A closed cylinder tank of radius 7 m and height 3 m is made from a sheet of metal. How much sheet of metal required? [2]
16. Find the value of x, so that $\left(\frac{5}{3}\right)^{-2} \times \left(\frac{5}{3}\right)^{-14} = \left(\frac{5}{3}\right)^{8x}$ [2]
17. The mass of an aluminium rod varies directly with its length. If a 16 cm long rod has a mass of 192g, find the length of the rod whose mass is 105g. [2]
18. Factorise the expressions: $7p^2 + 21q^2$ [2]
19. Is 46656 a perfect cube? [2]
20. Devangi's phone subscription charges for the period 17-02-09 to 16-03-09 were as follows [2]

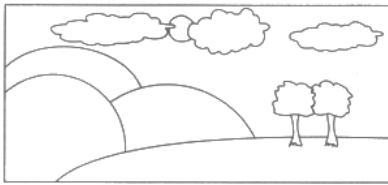
Period	Amount (in ₹)	Service tax %
17-02-09 to 23-02-09	199.75	12%
24-02-09 to 16-03-09	599.25	10%

Find the final bill amount, if 3% education cess was also charged on service tax.

21. The following is the time-distance graph of Sneha's walking. [2]



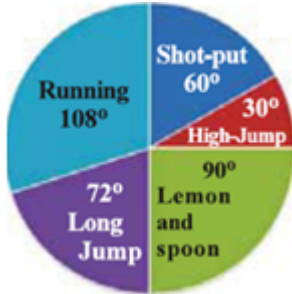
- a. When does Sneha make the least progress ? Explain your reasoning.
- b. Find her average speed in km/h.
22. The actual length of a painting was 2m. What is the length in the photograph if the scale used is 1 mm : 20 cm. [2]



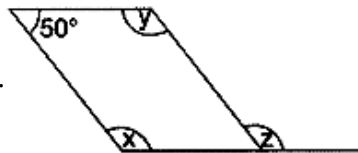
23. Simplify and solve the linear equation $3(t - 3) = 5(2t + 1)$. [2]

Section D

24. The following pie graph shows the information about the participation of 60 students of the school in various game during the sports day. Answer the questions based on that. [3]



- a. In which game, least number of students took part?
 b. How many student took part in shot-put?
25. What must be added to $2m^2 - 3mn + 3n^2$ to get $5m^2 + 2mn + 7n^2$? [3]
26. Consider the parallelogram. Find the degree values of the unknowns x , y , and z . [3]



27. Express $\frac{5}{-3} + \left(\frac{3}{-2}\right) + \left(\frac{-7}{3}\right) + 3$ as a rational number in $\frac{p}{q}$ form. [3]
28. Find the length of the side of a square, if the length of its diagonal is 10 cm. [3]

Section E

29. Two cubes have volumes in the ratio of 1:64. Find the ratio of the areas of a face of first cube to that of the other. [5]
30. Simplify: $\left(\frac{1}{4} \times \frac{2}{7}\right) - \left(\frac{5}{14} \times \frac{-2}{3}\right) + \left(\frac{3}{7} \times \frac{9}{2}\right)$. [5]
31. Express the following as the sum of two consecutive integers. [5]
- 21^2
 - 13^2
 - 11^2
 - 19^2

Solution

Section A

1. Choose the correct answers to the questions from the given options.

- (i) (b) associative

Explanation: {

Since, $a + \{b + c\} = (a + b) + c$ is associative property.

- (ii) (b) A

Explanation: {

The answer is 49^2 as here the unit's digit is 9 and $9^2 = 81$ where the unit's digit is 1, so 49^2 would end with digit 1.

- (iii) (c) 2000

Explanation: {

$$\therefore \text{Required number of boxes} = \frac{\text{volume of godown}}{\text{volume of each box}}$$

[\because Volume of cuboid = length \times breadth \times height]

$$= \frac{20 \times 25 \times 10}{2 \times 1.25 \times 1} = 2000$$

- (iv) (c) $\frac{1}{2}$

Explanation: {

$$\frac{1}{2}$$

- (v) (c) 50

Explanation: {

Cost of one cycle = ₹ 525

\therefore Cost of 52 cycles = ₹ 525 \times 52 = ₹ 27300

New cost of one cycle = ₹ (525 + 21) = ₹ 546

So, number of cycles bought with ₹ 27300 = $\frac{27300}{546} = 50$

- (vi) (d) $(a^2 + a + 1)(a^2 - a + 1)$

Explanation: {

$$a^4 + a^2 + 1 = (a^2 + 1)^2 - a^2$$

$$= (a^2 + 1)^2 - (a)^2$$

$$= (a^2 + a + 1)(a^2 - a + 1)$$

- (vii) (c) $27x^3$, $125x^3$, $343x^3$

Explanation: {

The cubes of $3x = 3x \times 3x \times 3x = 27x^3$

$$5x = 5x \times 5x \times 5x = 125x^3$$

$$7x = 7x \times 7x \times 7x = 343x^3$$

- (viii) (c) None of these

Explanation: {

$$\frac{5x-3y}{5y-3x} = \frac{y}{x}$$

$$\Rightarrow \frac{5-3\left(\frac{y}{x}\right)}{5\left(\frac{y}{x}\right)-3} = \frac{3}{4}$$

$$\Rightarrow 20 - 12\left(\frac{y}{x}\right) = 15\left(\frac{y}{x}\right) - 9$$

$$\Rightarrow 27\left(\frac{y}{x}\right) = 29 \Rightarrow \frac{y}{x} = \frac{29}{27}$$

- (ix) (b) 180

Explanation: {

Total watches sold = (20 + 50 + 20 + 60 + 30) = 180



(x)

(c)

Explanation: {

2. Fill in the blanks:

- (i) 1. part
- (ii) 1. Negative
- (iii) 1. adjacent
- (iv) 1. Rational number
- (v) 1. 7
2. seven
- (vi) 1. 60
2. sixty

3. 1. (b),
2. (a),
3. (d),
4. (c)

Section B

4. We have,

$$\begin{aligned}y^2 - 2y - 15 &= y^2 + (3 - 5)y - 15 \\&= y^2 + 3y - 5y - 15 \\&= y(y + 3) - 5(y + 3) \\&= (y + 3)(y - 5)\end{aligned}$$

5. Given, one side of a cube = 15 m

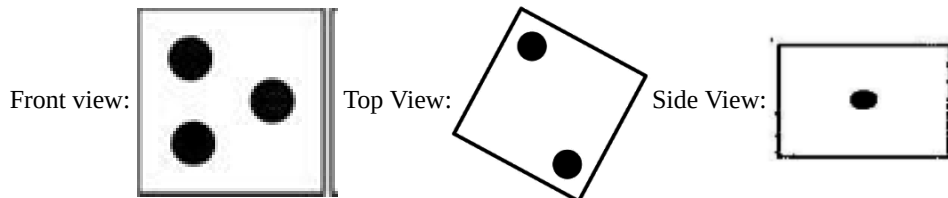
$$\begin{aligned}\text{therefore, Volume of cube} &= (\text{Side})^3 = (15)^3 = 3375 \text{ m}^3 \\ \text{Hence, the volume of cube is } &3375 \text{ m}^3.\end{aligned}$$

6. First convert both the distances to the same unit

$$\begin{aligned}\text{So, } 3 \text{ km} &= 3 \times 1000 \text{ m} = 3000 \text{ m} [1\text{km} = 1000\text{m}] \\ \text{Thus, the required ratio, } 3 \text{ km} : 300 \text{ m} &= 3000 : 300 = 10 : 1.\end{aligned}$$

7. From the graph, it is clear that 2005 shows the greatest jump in sales which is clear from the steepest angle between these years.

8. We have given a dice:



9. Given, $8x - 7 - 3x = 6x - 2x - 3$

$$\begin{aligned}\Rightarrow 8x - 3x - 6x + 2x &= -3 + 7 \text{ [transposing } 6x, -2x \text{ to LHS and } -7 \text{ to RHS]} \\ \therefore x &= 4\end{aligned}$$

10. There are all 10 outcomes of the event. Getting a number 6 has one outcome only.

$$\text{So the probability of getting a number 6} = \frac{1}{10}.$$

11. We have, $-7st$, -1 and $-13st^2$

$$\therefore -7st \times (-1) \times (-13st^2) = [-7 \times (-1) \times (-13)]st \times (st^2) = -91s^2t^3$$

12. Concave Polygon: A concave polygon is defined as a polygon with one or more interior angles greater than 180° . It looks sort of like a vertex has been 'pushed in' towards the inside of the polygon.



Therefore, Concave polygon is: 1

13. Multiplicative property of zero.

Section C

14. $90 - 1 = 89$

$$89 - 3 = 86$$

$$86 - 5 = 81$$

$$81 - 7 = 74$$

$$74 - 9 = 65$$

$$65 - 11 = 54$$

$$54 - 13 = 41$$

$$41 - 15 = 26$$

$$26 - 17 = 9$$

$$9 - 19 = -10$$

This shows that we are not able to express 90 as the sum of consecutive odd numbers starting with 1.

Therefore, 90 is not a perfect square.

15. $r = 7$ m

$$h = 3$$
 m

\therefore Total surface area

$$= 2\pi r(r + h)$$

$$= 2 \times \frac{22}{7} \times 7 \times (7 + 3)$$

$$= 440 \text{ m}^2$$

Hence, 440m^2 of metal sheet is required.

16. We have, $\left(\frac{5}{3}\right)^{-2} \times \left(\frac{5}{3}\right)^{-14} = \left(\frac{5}{3}\right)^{8x}$

Using law of exponents, $a^m \times a^n = (a)^{m+n}$ [\because a is non-zero integer]

$$\text{Then, } \left(\frac{5}{3}\right)^{-2} \times \left(\frac{5}{3}\right)^{-14} = \left(\frac{5}{3}\right)^{8x}$$

$$\Rightarrow \left(\frac{5}{3}\right)^{-2-14} = \left(\frac{5}{3}\right)^{8x}$$

$$\Rightarrow \left(\frac{5}{3}\right)^{-16} = \left(\frac{5}{3}\right)^{8x}$$

On comparing both sides, we get $-16 = 8x$

$$\Rightarrow x = -2$$

17. According to the question, the mass (m) of an aluminium rod varies directly with its length

(l). Here, we use the direct proportion.

In direct proportion, $\frac{m}{l} = k$ (constant)

$$\therefore \frac{m}{l} = \frac{192}{16} = 12$$

$$\Rightarrow k = 12$$

If mass of the rod = 105 g

$$\text{Then, } \frac{m}{l} = k$$

$$\Rightarrow \frac{105}{l} = 12$$

$$\Rightarrow l = \frac{105}{12} = 8.75 \text{ cm}$$

18. $7p^2 + 21q^2$

$$7p^2 + 21q^2 = 7(p^2 + 3q^2)$$



	2	46656
	2	23328
	2	11664
	2	5832
	2	2916
	2	1458
19.	3	729
	3	243
	3	81
	3	27
	3	9
	3	3
		1

By prime factorisation,

$$46656 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times \underline{3} \times \underline{3} \times \underline{3} \times \underline{3} \times \underline{3} \times \underline{3} \text{ [grouping the factors in triplets]}$$

$$= 2^3 \times 2^3 \times 3^3 \times 3^3$$

$= 36^3$ which is a perfect cube.

All the terms form triplets

Therefore, 46656 is a perfect cube.

20. On the basis of above given table,

Amount for period 17-02-09 to 23-02-09 = ₹199.75

Amount with service tax 12% = $199.75 + \frac{12}{100} \times 199.75 = 199.75 + 23.97 = ₹ 223.72$

Amount for period 24-02-09 to 16-03-09 = ₹599.25

Amount with service tax @ 10% = $599.25 + 599.25 \times \frac{10}{100}$

$= 599.25 + 59.925 = ₹ 659.175$

\therefore Total bill amount = ₹223.72 + ₹ 659.175 = ₹882.895

Total bill amount including education cess of 3% = $882.895 + 3\% \text{ of } 882.895$

$= 882.895 + \frac{3}{100} \times 882.895$

$= 882.895 + 26.486 = ₹909.39$

21. a. Sneha made the least progress between 25 min to 40 min. Observing the graph carefully, we see that initially, she is travelling approximately 0.5 km in 10 min, 0.25 km in 5 min, till the first 25 min. But after 25 min, her speed decreased as she travelled 0.25 km in 15 min (between 25 min to 40 min).

$$\text{b. Average speed} = \frac{\text{Total distance travelled}}{\text{Time}} = \frac{2}{55/60} = \frac{2}{55} \times 60 = 2.18 \text{ km/h}$$

22. The actual length of the painting was 2 m or $2 \times 100 = 200 \text{ cm}$ [$\because 1 \text{ m} = 100 \text{ cm}$]

Scale used in the painting = 1 mm : 20 cm

Hence, length of painting in photograph = Scale \times Actual Size $\left[\because \text{scale} = \frac{\text{size drawn}}{\text{actual size}} \right]$

$$= \frac{1}{20} \times 200 = 10 \text{ mm}$$

23. $3(t - 3) = 5(2t + 1)$

$$\therefore 3t - 9 = 10t + 5$$

$$\therefore 3t - 10t = 5 + 9 \dots \text{[Transposing } 10t \text{ to L.H.S. and } -9 \text{ to R.H.S.]}$$

$$\therefore -7t = 14$$

$$\therefore t = -\frac{14}{7} \dots \text{[Dividing both sides by } -7]$$

$$\therefore t = -2$$

this is the required solution.

Verification,

$$\text{L.H.S.} = 3(t - 3) = 3(-2 - 3) = 3(-5) = -15$$

$$\text{R.H.S.} = 5(2t + 1) = 5(2 \times (-2) + 1) = 5(-4 + 1)$$

$$= 5(-3) = -15 = \text{L.H.S}$$

Section D

24. a. High-jump
b. 10 student took part in shot-put.

25. 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 $3m^2 + 5mn + 4n^2$.

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

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

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

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

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

$$27. \frac{3 \times -1}{(-2 \times -1)} = \frac{-3}{2}, \frac{5 \times -1}{(-3 \times -1)} = \frac{-5}{3}$$

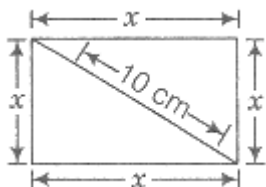
LCM of 3, 2, 3 and 1 is 6

$$= \frac{[-10 + (-9) + (-14) + 18]}{6}$$

$$= \frac{[-10 - 9 - 14 + 18]}{6}$$

$$= \frac{-15}{6} = \frac{-5}{2}$$

28. Given, length of diagonal = 10 cm Suppose, the length of side of a square is x cm. By using Pythagoras theorem,



$$(10)^2 = x^2 + x^2$$

$$\Rightarrow 100 = 2x^2$$

$$\Rightarrow x^2 = 50$$

$$\Rightarrow x = \sqrt{50} \text{ [taking square root on both sides]}$$

$$\therefore x = 5\sqrt{2} \text{ cm}$$

Hence, the length of the side of square is $\sqrt{50}$ or $5\sqrt{2}$ cm.

Section E

29. Let a and b be the edges of the two cubes respectively.

Then, according to the question

$$a^3 : b^3 = 1 : 64$$

$$\frac{a^3}{b^3} = \frac{1}{64}$$

$$\left(\frac{a}{b}\right)^3 = \left(\frac{1}{4}\right)^3$$

$a : b = 1 : 4$ (Taking cube roots on both sides)

Now, ratio of areas,

$$\left(\frac{a}{b}\right)^2 = \left(\frac{1}{4}\right)^2 \text{ (Surface area of cube is } 6a^2)$$

$$\frac{a^2}{b^2} = \frac{1}{16}$$

$$a^2 : b^2 = 1 : 16$$

$$30. \left(\frac{1}{4} \times \frac{2}{7}\right) - \left(\frac{5}{14} \times \frac{-2}{3}\right) + \left(\frac{3}{7} \times \frac{9}{2}\right)$$

$$= \left(\frac{2}{28}\right) - \left(\frac{-10}{42}\right) + \left(\frac{27}{14}\right)$$

$$= \left(\frac{1}{14}\right) - \left(\frac{-5}{21}\right) + \left(\frac{27}{14}\right)$$

LCM is 42

$$= \frac{(3 - (-10) + 81)}{42}$$

$$= \frac{(3+10+81)}{42}$$

$$\frac{94}{42} = \frac{47}{21}$$

The answer is $\frac{47}{21}$.

31. i. 21^2

$$21^2 = 441 = 220 + 221$$

ii. 13^2

$$13^2 = 169 = 84 + 85$$

iii. 11^2

$$11^2 = 121 = 60 + 61$$

iv. 19^2

$$19^2 = 361 = 180 + 181$$

