

AISSEE Mathematics

Sample Paper – 6

Duration: 60 Minutes

Maximum Marks: 150

Instructions

- This paper contains **50** Multiple Choice Questions (Single Correct Answer), modelled on the Mathematics portion of **AISSEE** (All India Sainik School Entrance Examination) for Class 6.
- Each correct answer carries **+3 marks**. There is **no negative marking** for incorrect or unattempted answers.
- Only **one** option is correct. Choose carefully.
- Syllabus level: **Class 5 (NCERT/CBSE) — Number System, Fractions, Decimals, LCM & HCF, Percentage, Profit & Loss, Ratio & Proportion, Simple Interest, Geometry, Mensuration, Data Handling.**
- Use of mobile phones, calculators, or electronic gadgets is strictly prohibited. Use the space in the question paper for rough work.

Q1. What is the **place value** of the digit **5** in the decimal number 34.582?

- (A) 0.05
- (B) 0.5
- (C) 5
- (D) 50

Q2. Which of the following is the **greatest** 8-digit number?

- (A) 6,54,23,789
- (B) 6,54,32,789
- (C) 6,54,32,798
- (D) 6,55,23,789



- Q3.** The Roman numeral **CDLXXIX** represents which number in Hindu-Arabic numerals?
- (A) 479
(B) 481
(C) 489
(D) 519
- Q4.** How many **3-digit numbers** are there in all?
- (A) 100
(B) 800
(C) 900
(D) 1000
- Q5.** In the number 4,57,23,819 written in the **Indian numeral system**, which digit is in the **ten-crore** place?
- (A) 5
(B) 4
(C) 7
(D) 2
- Q6.** The product of **any two odd numbers** is always:
- (A) Even
(B) Zero
(C) Prime
(D) Odd
- Q7.** Using the correct order of operations (BODMAS), evaluate: $100 - (20 + 5 \times 4 \div 2)$
- (A) 50

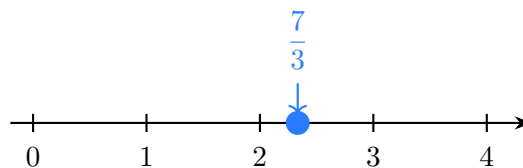


- (B) 60
- (C) 70
- (D) 80

Q8. Which of the following numbers is a **perfect square**?

- (A) 81
- (B) 50
- (C) 72
- (D) 98

Q9. The number line below shows the fraction $\frac{7}{3}$. Between which two **consecutive whole numbers** does $\frac{7}{3}$ lie?



- (A) 0 and 1
- (B) 1 and 2
- (C) 2 and 3
- (D) 3 and 4

Q10. $\frac{3}{4}$ of an hour is equal to how many **minutes**?

- (A) 30
- (B) 45
- (C) 60
- (D) 75

Q11. What is the **multiplicative inverse** (reciprocal) of $\frac{5}{3}$?



- (A) $\frac{3}{5}$
- (B) $\frac{5}{3}$
- (C) $-\frac{5}{3}$
- (D) $\frac{1}{5}$

Q12. Which pair of fractions is **equivalent** (equal in value)?

- (A) $\frac{2}{3}$ and $\frac{3}{4}$
- (B) $\frac{5}{6}$ and $\frac{6}{7}$
- (C) $\frac{4}{5}$ and $\frac{5}{6}$
- (D) $\frac{3}{4}$ and $\frac{9}{12}$

Q13. Find the sum: $3\frac{1}{4} + 2\frac{3}{8}$

- (A) $5\frac{1}{2}$
- (B) $5\frac{5}{8}$
- (C) 6
- (D) $6\frac{1}{8}$

Q14. Subtract: $\frac{5}{6} - \frac{2}{9}$

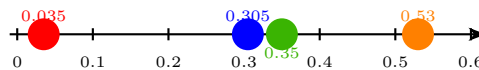
- (A) 1
- (B) $\frac{7}{15}$
- (C) $\frac{11}{18}$
- (D) $\frac{13}{18}$

Q15. A notebook costs Rs. 8.50. What is the total cost of **12 notebooks**?



- (A) Rs. 102
- (B) Rs. 98
- (C) Rs. 106
- (D) Rs. 112

Q16. The number line below shows four decimal numbers. Which decimal is the **smallest**?



- (A) 0.35
- (B) 0.305
- (C) 0.53
- (D) 0.035

Q17. In a class of **45 students**, 27 are girls. What percentage of the class are **girls**?

- (A) 45%
- (B) 60%
- (C) 27%
- (D) 40%

Q18. A jacket has a marked price of Rs. 2500 and is sold for Rs. 2000. What is the **percentage discount**?

- (A) 10%
- (B) 15%
- (C) 20%
- (D) 25%

Q19. A dealer buys a cycle for Rs. 1500 and sells it for Rs. 1725. What is his **profit percentage**?



- (A) 10%
- (B) 12%
- (C) 14%
- (D) 15%

Q20. An article is sold for Rs. 480 at a **gain of 20%**. What was the **cost price**?

- (A) Rs. 400
- (B) Rs. 384
- (C) Rs. 360
- (D) Rs. 300

Q21. A shopkeeper buys **50 eggs** at Rs. 4 each. He sells **40 eggs** at Rs. 5 each, but the remaining 10 eggs are broken and cannot be sold. What is his overall result?

- (A) Profit of Rs. 40
- (B) Loss of Rs. 40
- (C) No profit, no loss
- (D) Profit of Rs. 20

Q22. An article is bought for Rs. 560. At what price should it be sold to earn a **profit of 25%**?

- (A) Rs. 640
- (B) Rs. 700
- (C) Rs. 720
- (D) Rs. 784

Q23. A vehicle depreciates by **10% each year**. Its **current value** is Rs. 81,000. What was its value **one year ago**?

- (A) Rs. 90,000



- (B) Rs. 72,900
- (C) Rs. 80,100
- (D) Rs. 1,00,000

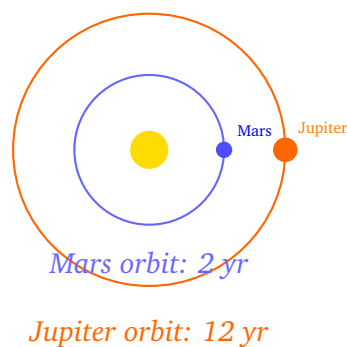
Q24. Find the **LCM** of 15, 20, and 25.

- (A) 100
- (B) 150
- (C) 200
- (D) 300

Q25. Using **Euclid's division lemma**, find the **HCF** of 84 and 56.

- (A) 14
- (B) 21
- (C) 28
- (D) 56

Q26. Mars takes **2 years** and Jupiter takes **12 years** to complete one orbit around the Sun. The diagram shows both planets aligned today. After how many years will they **next align** in the same position?



- (A) 2 years
- (B) 12 years
- (C) 24 years



(D) 6 years

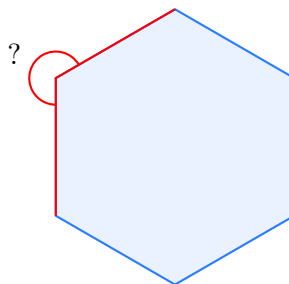
Q27. For which of the following does the property $\text{HCF} \times \text{LCM} = \text{Product of the two numbers}$ hold?

- (A) Any pair of natural numbers
- (B) Only prime numbers
- (C) Only even numbers
- (D) Only consecutive numbers

Q28. Which of the following pairs of numbers is **co-prime** (i.e., their HCF is 1)?

- (A) (12, 16)
- (B) (14, 21)
- (C) (15, 22)
- (D) (18, 24)

Q29. The figure below shows a **regular hexagon**. What is the measure of each interior angle?



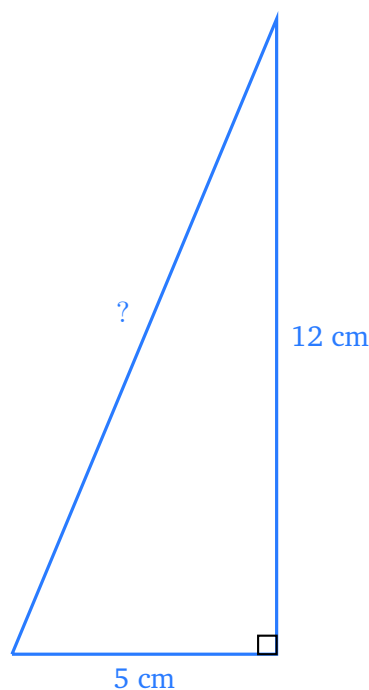
- (A) 120°
- (B) 108°
- (C) 90°
- (D) 60°

Q30. In a **rhombus**, one angle measures 60° . What is the measure of the opposite angle?



- (A) 30°
- (B) 90°
- (C) 120°
- (D) 60°

Q31. The right triangle below has legs of length **5 cm** and **12 cm**. Find the length of the **hypotenuse**.



- (A) 10 cm
- (B) 13 cm
- (C) 15 cm
- (D) 17 cm

Q32. A **square** is a special type of which quadrilateral?

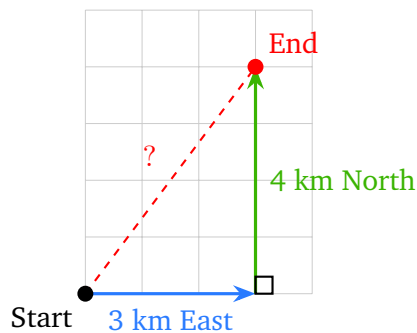
- (A) Trapezium
- (B) Rhombus only
- (C) Rectangle
- (D) Kite



Q33. Two straight lines are said to be **perpendicular** when the angle between them is:

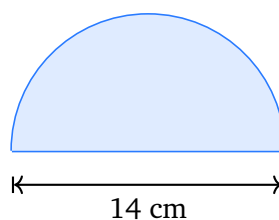
- (A) 90°
- (B) 180°
- (C) 45°
- (D) 360°

Q34. An ant walks **3 km East**, then turns and walks **4 km North**, as shown in the grid below. What is the **shortest straight-line distance** from its starting point to its final position?



- (A) 7 km
- (B) 3 km
- (C) 4 km
- (D) 5 km

Q35. The figure shows a **semicircle** with diameter 14 cm. What is the **perimeter** of the semicircle? (Use $\pi = \frac{22}{7}$)

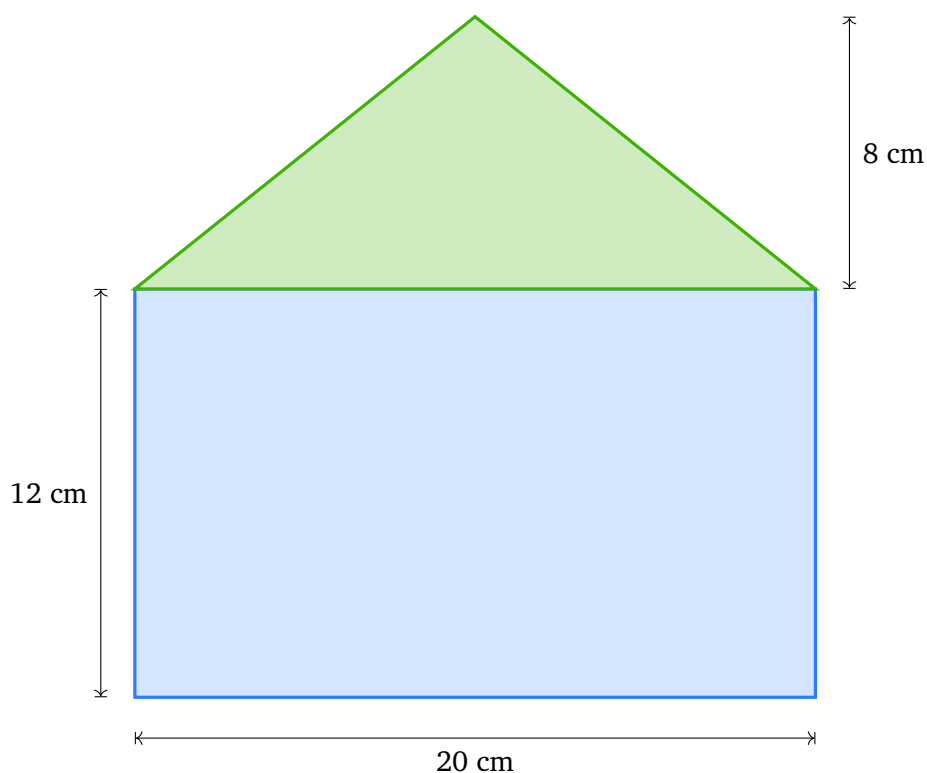


- (A) 22 cm



- (B) 36 cm
- (C) 44 cm
- (D) 66 cm

Q36. The composite figure below consists of a **rectangle** (length 20 cm, width 12 cm) with a **triangle** sitting on top (base 20 cm, height 8 cm). Find the **total area** of the figure.



- (A) 240 cm^2
- (B) 280 cm^2
- (C) 320 cm^2
- (D) 360 cm^2

Q37. The **total surface area** of a cube is 294 cm^2 . Find the **length of its side**.

- (A) 7 cm
- (B) 6 cm
- (C) 8 cm



(D) 49 cm

Q38. A rectangular garden measures $80 \text{ m} \times 50 \text{ m}$. A **4 m wide path** surrounds the garden on the outside. What is the **area of the path**?

(A) 720 m^2

(B) 880 m^2

(C) 960 m^2

(D) 1104 m^2

Q39. A room measures $8 \text{ m} \times 5 \text{ m}$. Carpet costs Rs. 120 per m^2 . What is the **total cost** to carpet the entire room?

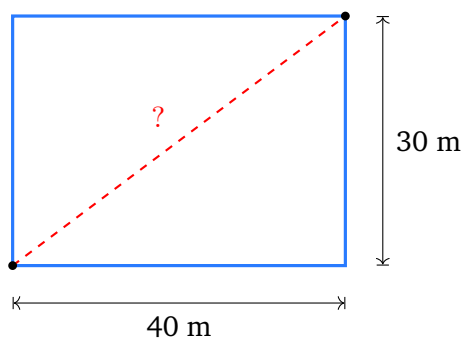
(A) Rs. 2400

(B) Rs. 3600

(C) Rs. 4800

(D) Rs. 6000

Q40. The diagram shows a **rectangle** with length 40 m and width 30 m. Find the length of its **diagonal**.



(A) 35 m

(B) 50 m

(C) 70 m

(D) 10 m



- Q41.** Cement and sand are mixed in the ratio 1 : 3. If **5 kg of cement** is used, how much **sand** is needed?
- (A) 3 kg
(B) 5 kg
(C) 15 kg
(D) 20 kg
- Q42.** A recipe uses **2 cups of sugar** to make 24 cookies. How many cups of sugar are needed to make **60 cookies**?
- (A) 5
(B) 4
(C) 6
(D) 3
- Q43.** $\frac{2}{3}$ of a number is 48. Find $\frac{3}{4}$ of that number.
- (A) 48
(B) 64
(C) 36
(D) 54
- Q44.** The ratio of a father's age to his son's age is 5 : 2. If the father is **35 years old**, how old is the son?
- (A) 7 years
(B) 14 years
(C) 21 years
(D) 28 years
- Q45.** 30 g of salt is dissolved in 120 g of a salt solution. What is the ratio of **salt to water** in the solution?



- (A) 1 : 3
- (B) 1 : 4
- (C) 3 : 1
- (D) 30 : 120

Q46. At what rate of Simple Interest will Rs. 5,000 amount to Rs. 7,000 in **how many years** at 8% per annum?

- (A) 2 years
- (B) 3 years
- (C) 4 years
- (D) 5 years

Q47. Ramesh invests Rs. 2000 at 5% per annum for 2 years. Suresh invests Rs. 3000 at 4% per annum for 2 years. What is the **difference in their Simple Interest earned**?

- (A) Rs. 80
- (B) Rs. 60
- (C) Rs. 40
- (D) Rs. 20

Q48. The scores of 8 students in a test are: 45, 52, 38, 67, 45, 55, 62, 45. Find the **mode** of the data.

- (A) 45
- (B) 52
- (C) 55
- (D) 62

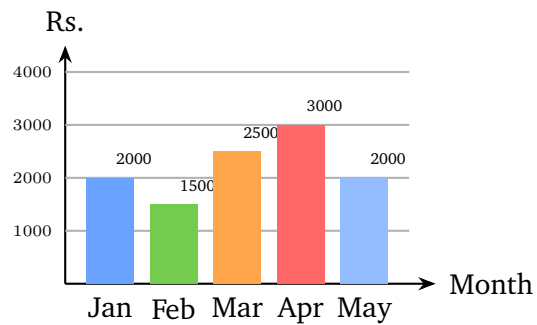
Q49. Find the **median** of the following data: 12, 8, 20, 15, 10, 18, 25, 6

- (A) 12



- (B) 13.5
- (C) 15
- (D) 16

Q50. The bar graph below shows Priya's **monthly savings** over 5 months. What is her **total savings** over all 5 months?



- (A) Rs. 3,000
- (B) Rs. 5,000
- (C) Rs. 8,000
- (D) Rs. 11,000



Detailed Solutions

Solution

Concept — Place Value in Decimals:

In a decimal number, the digits after the decimal point occupy the tenths, hundredths, thousandths, ... places respectively. In 34.582: 5 is in the *tenths* place, 8 in the hundredths place, and 2 in the thousandths place.

Solution:

Number: 34.582

Position of 5: first digit after the decimal point = tenths place.

Place value of 5 = $5 \times \frac{1}{10} = \frac{5}{10} = 0.5$

Why other options are wrong:

- Q1.**
- **Option A:** 0.05 would be the place value if 5 were in the *hundredths* place (second position after decimal).
 - **Option B:** 0.5 — correct.
 - **Option C:** 5 is the *face value*, not the place value in this context.
 - **Option D:** 50 makes no sense; digits after the decimal point have values less than 1.

Final Answer: Place value of 5 in 34.582 = 0.5 $\Rightarrow$ **(B)**

Answer: (B) [↑ Go back to Q 1](#)

Solution

Concept — Comparing Large Numbers:

To find the greatest number, compare digit by digit from the leftmost (highest place value). The number with the larger digit at the first differing position is greater.

Solution:

All four options are 8-digit numbers. In Indian notation:

A) 6,54,23,789 B) 6,54,32,789 C) 6,54,32,798 D) 6,55,23,789

Compare the digit in the ten-lakh place (3rd digit from left): A, B, C all have 4; D has 5. Since $5 > 4$, option D is the greatest.

Why other options are wrong:

- Q2.**
- **Option A:** Ten-lakh digit is $4 < 5$ (D's digit), so A is smaller than D.
 - **Option B:** Ten-lakh digit is $4 < 5$, smaller than D.
 - **Option C:** Ten-lakh digit is $4 < 5$, smaller than D.



- **Option D:** 6,55,23,789 — correct, greatest.

Final Answer: Greatest number = 6,55,23,789 $\Rightarrow$ **(D)**

Answer: (D) [↑ Go back to Q 2](#)

Solution

Concept — Roman Numerals:

Key values: C=100, D=500, L=50, X=10, V=5, I=1. When a smaller value precedes a larger one, it is subtracted (e.g., CD = 400, IX = 9).

Solution:

$$\text{CDLXXIX} = \text{CD} + \text{L} + \text{XX} + \text{IX} = 400 + 50 + 20 + 9 = 479$$

Why other options are wrong:

- Q3.**
- **Option A:** 479 — correct.
 - **Option B:** 481 would be CDLXXXI.
 - **Option C:** 489 would be CDLXXXIX.
 - **Option D:** 519 would be DXIX.

Final Answer: CDLXXIX = 479 $\Rightarrow$ **(A)**

Answer: (A) [↑ Go back to Q 3](#)

Solution

Concept — Counting Numbers in a Range:

The number of integers from a to b inclusive = $b - a + 1$.

Solution:

3-digit numbers range from 100 to 999.

$$\text{Count} = 999 - 100 + 1 = 900$$

Why other options are wrong:

- Q4.**
- **Option A:** 100 — only 2-digit numbers span 100 values (10 to 99).
 - **Option B:** 800 — incorrect subtraction without the +1 correction.
 - **Option C:** 900 — correct.
 - **Option D:** 1000 — includes 1000, which is a 4-digit number.

Final Answer: Total 3-digit numbers = 900 $\Rightarrow$ **(C)**

Answer: (C) [↑ Go back to Q 4](#)



Solution**Concept — Indian Place Value System:**

In the Indian system: ones, tens, hundreds, thousands, ten-thousands, lakhs, ten-lakhs, crores, **ten-crores**, ...

Solution:

4,57,23,819: writing out the place values from right:

4	5	7	2	3	8	1	1	9
└─┬─┘	└─┬─┘	└─┬─┘	└─┬─┘	└─┬─┘	└─┬─┘	└─┬─┘	└─┬─┘	└─┬─┘
ten-cr	cr	10-lakh	lakh	10-thou	thou	hun	tens	ones

The digit in the **ten-crore** place is 4.

Why other options are wrong:

- Q5.**
- **Option A:** 5 is in the crore place, not ten-crore.
 - **Option B:** 4 — correct.
 - **Option C:** 7 is in the ten-lakh place.
 - **Option D:** 2 is in the lakh place.

Final Answer: Digit in ten-crore place = 4 $\Rightarrow$ **(B)**

Answer: (B) [↑ Go back to Q 5](#)

Solution**Concept — Properties of Odd and Even Numbers:**

An odd number can be written as $2k + 1$. The product of two odd numbers: $(2a + 1)(2b + 1) = 4ab + 2a + 2b + 1 = 2(2ab + a + b) + 1$, which is always odd.

Solution:

Examples: $3 \times 5 = 15$ (odd); $7 \times 9 = 63$ (odd); $11 \times 13 = 143$ (odd).

The product of **any two odd numbers is always odd**.

Why other options are wrong:

- Q6.**
- **Option A:** Even — only possible if at least one factor is even.
 - **Option B:** Zero — only if one factor is zero, which is even.
 - **Option C:** Prime — not necessarily; $3 \times 5 = 15$ is not prime.
 - **Option D:** Odd — correct.

Final Answer: Product of two odd numbers is always Odd $\Rightarrow$ **(D)**

Answer: (D) [↑ Go back to Q 6](#)



Solution**Concept — BODMAS Rule:**

BODMAS: Brackets, Orders (powers/roots), Division, Multiplication, Addition, Subtraction. Operations inside brackets are done first.

Solution:

$$100 - (20 + 5 \times 4 \div 2)$$

Step 1 (inside bracket — M & D first): $5 \times 4 = 20$, then $20 \div 2 = 10$

Step 2 (addition inside bracket): $20 + 10 = 30$

Step 3 (subtraction): $100 - 30 = 70$

Why other options are wrong:

- Q7.**
- **Option A:** 50 — results from computing $5 \times 4 \div 2$ as $(5 \times 4) \div 2$ but then adding incorrectly.
 - **Option B:** 60 — error in bracket evaluation.
 - **Option C:** 70 — correct.
 - **Option D:** 80 — ignores part of the bracket contents.

Final Answer: $100 - (20 + 5 \times 4 \div 2) = 70 \Rightarrow \text{(C)}$

Answer: (C) [↑ Go back to Q 7](#)

Solution**Concept — Perfect Squares:**

A perfect square is a number that equals the square of a whole number: n^2 for some integer n .

Solution:

$$81 = 9^2 \checkmark \quad 50 - \sqrt{50} \approx 7.07 \text{ (not whole)} \quad 72 - \sqrt{72} \approx 8.49 \quad 98 - \sqrt{98} \approx 9.89$$

Only 81 is a perfect square.

Why other options are wrong:

- Q8.**
- **Option A:** $81 = 9 \times 9$ — correct.
 - **Option B:** $50 = 2 \times 25$; not a perfect square.
 - **Option C:** $72 = 8 \times 9$; not a perfect square.
 - **Option D:** $98 = 2 \times 49$; not a perfect square.

Final Answer: 81 is a perfect square $\Rightarrow \text{(A)}$

Answer: (A) [↑ Go back to Q 8](#)



Solution**Concept — Locating Fractions on a Number Line:**

Convert the fraction to a mixed number or decimal to identify which two whole numbers it lies between.

Solution:

$$\frac{7}{3} = 2\frac{1}{3} \approx 2.33$$

Since $2 < 2.33 < 3$, the fraction $\frac{7}{3}$ lies between the whole numbers 2 and 3.

Why other options are wrong:

- Q9.**
- **Option A:** 0 and 1: $\frac{7}{3} > 1$.
 - **Option B:** 1 and 2: $\frac{7}{3} > 2$.
 - **Option C:** 2 and 3 — correct.
 - **Option D:** 3 and 4: $\frac{7}{3} < 3$.

Final Answer: $\frac{7}{3}$ lies between 2 and 3 $\Rightarrow$ (C)

Answer: (C) [↑ Go back to Q9](#)

Solution**Concept — Fraction of a Unit of Time:**

1 hour = 60 minutes. To find a fraction of an hour, multiply the fraction by 60.

Solution:

$$\frac{3}{4} \text{ hour} = \frac{3}{4} \times 60 = \frac{180}{4} = 45 \text{ minutes}$$

Why other options are wrong:

- Q10.**
- **Option A:** $30 = \frac{1}{2} \times 60$, which corresponds to $\frac{1}{2}$ hour.
 - **Option B:** 45 — correct.
 - **Option C:** 60 is the full hour.
 - **Option D:** $75 > 60$, which exceeds one hour.

Final Answer: $\frac{3}{4}$ hour = 45 minutes $\Rightarrow$ (B)

Answer: (B) [↑ Go back to Q10](#)

Solution**Concept — Multiplicative Inverse (Reciprocal):**

The multiplicative inverse of a fraction $\frac{p}{q}$ is $\frac{q}{p}$, because $\frac{p}{q} \times \frac{q}{p} = 1$.

Solution:

Reciprocal of $\frac{5}{3} = \frac{3}{5}$

Verification: $\frac{5}{3} \times \frac{3}{5} = \frac{15}{15} = 1 \checkmark$

Why other options are wrong:

- Q11.**
- **Option A:** $\frac{3}{5}$ — correct.
 - **Option B:** $\frac{5}{3}$ is the original number, not its reciprocal.
 - **Option C:** $-\frac{5}{3}$ is the additive inverse of $\frac{5}{3}$, not the multiplicative inverse.
 - **Option D:** $\frac{1}{5}$ would be the reciprocal of 5, not $\frac{5}{3}$.

Final Answer: Multiplicative inverse of $\frac{5}{3} = \frac{3}{5} \Rightarrow$ **(A)**

Answer: (A) [↑ Go back to Q 11](#)

Solution

Concept — Equivalent Fractions:

Two fractions are equivalent if they simplify to the same value. Cross-multiply to check: $\frac{a}{b} = \frac{c}{d}$ if $a \times d = b \times c$.

Solution:

Check option D: $\frac{3}{4}$ and $\frac{9}{12}$

$$\frac{9}{12} = \frac{9 \div 3}{12 \div 3} = \frac{3}{4} \checkmark$$

Cross-check others: $\frac{2}{3}$ vs $\frac{3}{4}$: $2 \times 4 = 8 \neq 3 \times 3 = 9$. $\frac{5}{6}$ vs $\frac{6}{7}$: $35 \neq 36$. $\frac{4}{5}$ vs $\frac{5}{6}$: $24 \neq 25$.

Why other options are wrong:

- Q12.**
- **Option A:** $\frac{2}{3} \neq \frac{3}{4}$ ($8 \neq 9$).
 - **Option B:** $\frac{5}{6} \neq \frac{6}{7}$ ($35 \neq 36$).
 - **Option C:** $\frac{4}{5} \neq \frac{5}{6}$ ($24 \neq 25$).
 - **Option D:** $\frac{9}{12} = \frac{3}{4}$ — correct.

Final Answer: $\frac{3}{4}$ and $\frac{9}{12}$ are equivalent $\Rightarrow$ **(D)**

Answer: (D) [↑ Go back to Q 12](#)

Solution

Concept — Addition of Mixed Numbers:

Convert each mixed number to an improper fraction, find the LCM of denomina-



tors, add, then convert back.

Solution:

$$3\frac{1}{4} = \frac{13}{4} \quad 2\frac{3}{8} = \frac{19}{8}$$

$$\text{LCM}(4, 8) = 8$$

$$\frac{13}{4} + \frac{19}{8} = \frac{26}{8} + \frac{19}{8} = \frac{45}{8} = 5\frac{5}{8}$$

Why other options are wrong:

Q13. • **Option A:** $5\frac{1}{2} = \frac{44}{8}$; our answer is $\frac{45}{8}$.

• **Option B:** $5\frac{5}{8}$ — correct.

• **Option C:** $6 = \frac{48}{8} > \frac{45}{8}$.

• **Option D:** $6\frac{1}{8} = \frac{49}{8} > \frac{45}{8}$.

Final Answer: $3\frac{1}{4} + 2\frac{3}{8} = 5\frac{5}{8} \Rightarrow \text{(B)}$

Answer: (B) [↑ Go back to Q 13](#)

Solution

Concept — Subtraction of Unlike Fractions:

Find the LCM of the denominators, convert to equivalent fractions with the same denominator, then subtract numerators.

Solution:

$$\frac{5}{6} - \frac{2}{9}$$

$$\text{LCM}(6, 9) = 18$$

$$\frac{5}{6} = \frac{15}{18} \quad \frac{2}{9} = \frac{4}{18}$$

$$\frac{15}{18} - \frac{4}{18} = \frac{11}{18}$$

Why other options are wrong:

Q14. • **Option A:** 1 would require $\frac{5}{6} - \frac{2}{9} = 1$, which is impossible since $\frac{5}{6} < 1$.

• **Option B:** $\frac{7}{15}$: incorrect LCM used (15 instead of 18).

• **Option C:** $\frac{11}{18}$ — correct.

• **Option D:** $\frac{13}{18}$: error in numerator computation.

Final Answer: $\frac{5}{6} - \frac{2}{9} = \frac{11}{18} \Rightarrow \text{(C)}$

Answer: (C) [↑ Go back to Q 14](#)



Solution**Concept — Multiplication of Decimals:**

Multiply the decimal cost by the number of items. Ignore the decimal point during multiplication, then insert it in the answer.

Solution:

Cost of 1 notebook = Rs. 8.50

$$\text{Cost of 12 notebooks} = 12 \times 8.50 = 12 \times \frac{850}{100} = \frac{10200}{100} = \mathbf{102}$$

Or directly: $12 \times 8 = 96$, and $12 \times 0.50 = 6$. Total = $96 + 6 = 102$.

Why other options are wrong:

- Q15.**
- **Option A:** Rs. 102 — correct.
 - **Option B:** Rs. 98 = 12×8.17 ; not our problem.
 - **Option C:** Rs. 106: error in calculation.
 - **Option D:** Rs. 112: corresponds to 12×9.33 ; incorrect.

Final Answer: Cost of 12 notebooks = Rs. 102 $\Rightarrow$ **(A)**

Answer: (A) [↑ Go back to Q 15](#)

Solution**Concept — Comparing Decimals:**

To compare decimals, align them at the decimal point and compare digit by digit from left to right. More zeros immediately after the decimal point mean a smaller number.

Solution:

Write with equal decimal places:

A) 0.350 B) 0.305 C) 0.530 D) 0.035

Compare tenths digit: A, B, C all have tenths digit ≥ 3 ; D has tenths digit 0.

$$0.035 < 0.305 < 0.350 < 0.530$$

Smallest = 0.035

Why other options are wrong:

- Q16.**
- **Option A:** $0.35 > 0.035$.
 - **Option B:** $0.305 > 0.035$.
 - **Option C:** $0.53 > 0.035$.
 - **Option D:** 0.035 — correct, smallest.

Final Answer: Smallest decimal = 0.035 $\Rightarrow$ **(D)**

Answer: (D) [↑ Go back to Q 16](#)



Solution**Concept — Percentage of a Quantity:**

$$\text{Percentage} = \frac{\text{Part}}{\text{Total}} \times 100$$

Solution:

Number of girls = 27, Total students = 45

$$\text{Percentage of girls} = \frac{27}{45} \times 100 = \frac{27 \times 100}{45} = \frac{2700}{45} = 60\%$$

Why other options are wrong:

- Q17.**
- **Option A:** 45% is the total count, not a percentage of girls.
 - **Option B:** 60% — correct.
 - **Option C:** 27% confuses the count (27) for the percentage.
 - **Option D:** 40% is the percentage of boys ($18/45 \times 100$).

Final Answer: Percentage of girls = 60% $\Rightarrow$ **(B)****Answer: (B)** [↑ Go back to Q 17](#)**Solution****Concept — Discount Percentage:**

Discount = Marked Price – Selling Price

$$\text{Discount \%} = \frac{\text{Discount}}{\text{Marked Price}} \times 100$$

Solution:

Marked Price = Rs. 2500, Selling Price = Rs. 2000

Discount = 2500 – 2000 = Rs. 500

$$\text{Discount \%} = \frac{500}{2500} \times 100 = \frac{50000}{2500} = 20\%$$

Why other options are wrong:

- Q18.**
- **Option A:** 10% of Rs. 2500 = Rs. 250 discount, giving SP = Rs. 2250 $\neq$ Rs. 2000.
 - **Option B:** 15% gives SP = Rs. 2125 $\neq$ Rs. 2000.
 - **Option C:** 20% — correct.
 - **Option D:** 25% gives SP = Rs. 1875 $\neq$ Rs. 2000.

Final Answer: Discount = 20% $\Rightarrow$ **(C)****Answer: (C)** [↑ Go back to Q 18](#)

Solution**Concept — Profit Percentage:**

$$\text{Profit} = \text{SP} - \text{CP} \quad \text{Profit \%} = \frac{\text{Profit}}{\text{CP}} \times 100$$

Solution:

$$\text{CP} = \text{Rs. } 1500, \text{ SP} = \text{Rs. } 1725$$

$$\text{Profit} = 1725 - 1500 = \text{Rs. } 225$$

$$\text{Profit \%} = \frac{225}{1500} \times 100 = \frac{22500}{1500} = 15\%$$

Why other options are wrong:

- Q19.**
- **Option A:** 10% of Rs. 1500 = Rs. 150 profit, SP = Rs. 1650 $\neq$ Rs. 1725.
 - **Option B:** 12% gives profit = Rs. 180, SP = Rs. 1680 $\neq$ Rs. 1725.
 - **Option C:** 14% gives profit = Rs. 210, SP = Rs. 1710 $\neq$ Rs. 1725.
 - **Option D:** 15% — correct.

Final Answer: Profit % = 15% $\Rightarrow$ (D)Answer: (D) [↑ Go back to Q 19](#)**Solution****Concept — Finding Cost Price from Selling Price and Gain:**

$$\text{SP} = \text{CP} \times \left(1 + \frac{\text{Gain\%}}{100}\right), \text{ so } \text{CP} = \frac{\text{SP}}{1 + \text{Gain\%/100}}$$

Solution:

$$\text{SP} = \text{Rs. } 480, \text{ Gain} = 20\%$$

$$\text{CP} = \frac{480}{1 + \frac{20}{100}} = \frac{480}{1.2} = \frac{480 \times 10}{12} = \frac{4800}{12} = 400$$

$$\text{Verification: Profit} = 400 \times 20\% = \text{Rs. } 80; \text{ SP} = 400 + 80 = 480 \checkmark$$

Why other options are wrong:

- Q20.**
- **Option A:** Rs. 400 — correct.
 - **Option B:** Rs. 384 = 480×0.8 ; wrong formula (subtracting 20% from SP).
 - **Option C:** Rs. 360: error in calculation.
 - **Option D:** Rs. 300: corresponds to $\frac{480}{1.6}$, which is 60% gain.

Final Answer: CP = Rs. 400 $\Rightarrow$ (A)Answer: (A) [↑ Go back to Q 20](#)**Solution****Concept — Profit and Loss with Damaged Goods:**

Total CP and Total SP must be computed considering all items bought, including



those that cannot be sold.

Solution:

$$\text{Total CP} = 50 \times 4 = \text{Rs. } 200$$

$$\text{Total SP} = 40 \times 5 = \text{Rs. } 200 \text{ (10 eggs broken, sell for Rs. 0)}$$

$$\text{SP} = \text{CP} \Rightarrow \text{No profit, no loss}$$

Why other options are wrong:

- Q21.**
- **Option A:** Profit Rs. 40 — incorrect; total SP equals total CP.
 - **Option B:** Loss Rs. 40 — incorrect; no loss occurred.
 - **Option C:** No profit, no loss — correct.
 - **Option D:** Profit Rs. 20 — incorrect calculation.

Final Answer: No profit, no loss $\Rightarrow$ (C)

Answer: (C) [↑ Go back to Q 21](#)

Solution

Concept — Selling Price for Desired Profit:

$$\text{SP} = \text{CP} \times \left(1 + \frac{\text{Profit}\%}{100}\right)$$

Solution:

$$\text{CP} = \text{Rs. } 560, \text{ Profit} = 25\%$$

$$\text{SP} = 560 \times \left(1 + \frac{25}{100}\right) = 560 \times \frac{125}{100} = 560 \times 1.25 = \mathbf{700}$$

$$\text{Verification: Profit} = 700 - 560 = 140 = 25\% \text{ of } 560 \checkmark$$

Why other options are wrong:

- Q22.**
- **Option A:** Rs. 640 = $560 \times \frac{114.3}{100}$; not 25% profit.
 - **Option B:** Rs. 700 — correct.
 - **Option C:** Rs. 720: corresponds to $560 \times 1.2857 \approx 28.6\%$ profit.
 - **Option D:** Rs. 784 = 560×1.4 , which is 40% profit.

Final Answer: SP for 25% profit = Rs. 700 $\Rightarrow$ (B)

Answer: (B) [↑ Go back to Q 22](#)

Solution

Concept — Depreciation (Reverse Calculation):

$$\text{If a value depreciates by } r\%, \text{ then: Current Value} = \text{Previous Value} \times \left(1 - \frac{r}{100}\right)$$



$$\text{So: Previous Value} = \frac{\text{Current Value}}{1 - r/100}$$

Solution:

Current value = Rs. 81,000, Depreciation rate = 10%

$$\text{Previous value} = \frac{81000}{1 - 0.10} = \frac{81000}{0.9} = \frac{81000 \times 10}{9} = 90,000$$

$$\text{Verification: } 90000 \times 0.9 = 81000 \checkmark$$

Why other options are wrong:

- Q23.**
- **Option A:** Rs. 90,000 — correct.
 - **Option B:** Rs. 72,900 = 81000×0.9 ; this would be the value *next* year.
 - **Option C:** Rs. 80,100 = $81000 - 900$; subtracts 1% of current value.
 - **Option D:** Rs. 1,00,000: adds 10% of Rs. 81000 to itself, an incorrect method.

Final Answer: Value one year ago = Rs. 90,000 $\Rightarrow$ (A)

Answer: (A) [↑ Go back to Q 23](#)

Solution

Concept — LCM of Three Numbers:

Prime factorise each number. LCM = product of highest powers of all prime factors.

Solution:

$$15 = 3 \times 5 \quad 20 = 2^2 \times 5 \quad 25 = 5^2$$

$$\text{LCM} = 2^2 \times 3 \times 5^2 = 4 \times 3 \times 25 = 300$$

$$\text{Verification: } 300 \div 15 = 20 \checkmark \quad 300 \div 20 = 15 \checkmark \quad 300 \div 25 = 12 \checkmark$$

Why other options are wrong:

- Q24.**
- **Option A:** 100 is not divisible by 15 ($100/15 = 6.67$).
 - **Option B:** 150 is not divisible by 20 ($150/20 = 7.5$).
 - **Option C:** 200 is not divisible by 15 ($200/15 = 13.3$).
 - **Option D:** 300 — correct.

Final Answer: LCM(15, 20, 25) = 300 $\Rightarrow$ (D)

Answer: (D) [↑ Go back to Q 24](#)

Solution

Concept — HCF using Euclid's Division Lemma:

Divide the larger number by the smaller. Replace the larger with the smaller, and the smaller with the remainder. Repeat until remainder is 0. The last non-zero



divisor is the HCF.

Solution:

$$84 = 56 \times 1 + 28$$

$$56 = 28 \times 2 + 0$$

$$\text{Remainder} = 0 \Rightarrow \text{HCF} = 28$$

Why other options are wrong:

- Q25.**
- **Option A:** 14 divides both 84 and 56, but is not the *greatest* common factor.
 - **Option B:** 21: $56 \div 21 = 2.67$ (not exact); 21 does not divide 56.
 - **Option C:** 28 — correct.
 - **Option D:** 56 divides 56 but not 84 ($84/56 = 1.5$); incorrect.

Final Answer: $\text{HCF}(84, 56) = 28 \Rightarrow \text{(C)}$

Answer: (C) [↑ Go back to Q 25](#)

Solution

Concept — LCM and Periodic Events:

Two periodic events that restart simultaneously will next coincide after a time equal to the LCM of their individual periods.

Solution:

Mars period = 2 years, Jupiter period = 12 years.

$$\text{LCM}(2, 12): 2 = 2, 12 = 2^2 \times 3.$$

$$\text{LCM} = 2^2 \times 3 = 12 \text{ years.}$$

Why other options are wrong:

- Q26.**
- **Option A:** 2 years — after 2 years, Mars completes 1 orbit but Jupiter has only done $1/6$ of its orbit; not aligned.
 - **Option B:** 12 years — correct.
 - **Option C:** 24 years — they would have aligned at 12 years already.
 - **Option D:** 6 years: $6/12 = 0.5$ orbits for Jupiter — not a complete orbit.

Final Answer: Next alignment in 12 years $\Rightarrow \text{(B)}$

Answer: (B) [↑ Go back to Q 26](#)

Solution

Concept — Relationship between HCF and LCM:

For any two natural numbers a and b : $\text{HCF}(a, b) \times \text{LCM}(a, b) = a \times b$.



Solution:

This is a universal property that holds for **any pair of natural numbers**, not just special types.

Example: $\text{HCF}(4, 6) = 2$, $\text{LCM}(4, 6) = 12$; $2 \times 12 = 24 = 4 \times 6$ ✓

Example: $\text{HCF}(5, 7) = 1$, $\text{LCM}(5, 7) = 35$; $1 \times 35 = 35 = 5 \times 7$ ✓

Why other options are wrong:

- Q27.**
- **Option A:** Any pair of natural numbers — correct.
 - **Option B:** Only prime numbers — too restrictive; property is more general.
 - **Option C:** Only even numbers — incorrect; holds for odd numbers too.
 - **Option D:** Only consecutive numbers — incorrect; holds for all natural number pairs.

Final Answer: The property holds for any pair of natural numbers $\Rightarrow$ (A)

Answer: (A) [↑ Go back to Q 27](#)

Solution**Concept — Co-prime Numbers:**

Two numbers are co-prime if their HCF (GCD) is 1. They share no common factor other than 1.

Solution:

A) $\text{HCF}(12, 16)$: $12 = 2^2 \times 3$, $16 = 2^4$; $\text{HCF} = 4 \neq 1$.

B) $\text{HCF}(14, 21)$: $14 = 2 \times 7$, $21 = 3 \times 7$; $\text{HCF} = 7 \neq 1$.

C) $\text{HCF}(15, 22)$: $15 = 3 \times 5$, $22 = 2 \times 11$; no common prime factors; $\text{HCF} = 1$ ✓

D) $\text{HCF}(18, 24)$: $18 = 2 \times 3^2$, $24 = 2^3 \times 3$; $\text{HCF} = 6 \neq 1$.

Why other options are wrong:

- Q28.**
- **Option A:** $\text{HCF}(12, 16) = 4$; not co-prime.
 - **Option B:** $\text{HCF}(14, 21) = 7$; not co-prime.
 - **Option C:** $\text{HCF}(15, 22) = 1$ — correct, co-prime.
 - **Option D:** $\text{HCF}(18, 24) = 6$; not co-prime.

Final Answer: (15, 22) is co-prime $\Rightarrow$ (C)

Answer: (C) [↑ Go back to Q 28](#)

Solution**Concept — Interior Angles of a Regular Polygon:**

Each interior angle of a regular n -gon $= \frac{(n-2) \times 180^\circ}{n}$

Solution:

For a regular hexagon, $n = 6$:

$$\text{Each interior angle} = \frac{(6-2) \times 180^\circ}{6} = \frac{4 \times 180^\circ}{6} = \frac{720^\circ}{6} = 120^\circ$$

Why other options are wrong:

- Q29.**
- **Option A:** 120° — correct.
 - **Option B:** 108° is each interior angle of a regular *pentagon* ($n = 5$).
 - **Option C:** 90° is each interior angle of a square ($n = 4$).
 - **Option D:** 60° is each interior angle of an equilateral triangle ($n = 3$).

Final Answer: Each interior angle of a regular hexagon $= 120^\circ \Rightarrow$ **(A)**

Answer: (A) [↑ Go back to Q 29](#)

Solution

Concept — Angles in a Rhombus:

In a rhombus, opposite angles are equal. Adjacent angles are supplementary (sum to 180°).

Solution:

One angle $= 60^\circ$.

Opposite angle $= 60^\circ$ (opposite angles in a rhombus are equal).

Check: Adjacent angle $= 180^\circ - 60^\circ = 120^\circ$.

The angle *opposite* to 60° is 60° .

Why other options are wrong:

- Q30.**
- **Option A:** 30° : half of 60° ; no such relationship in a rhombus.
 - **Option B:** 90° : only if it is a square (all angles 90°).
 - **Option C:** 120° : this is the *adjacent* angle, not the opposite.
 - **Option D:** 60° — correct (opposite angle equals the given angle).

Final Answer: Opposite angle $= 60^\circ \Rightarrow$ **(D)**

Answer: (D) [↑ Go back to Q 30](#)

Solution

Concept — Pythagoras' Theorem:

In a right triangle with legs a and b and hypotenuse c : $c^2 = a^2 + b^2$

Solution:



Legs: $a = 5$ cm, $b = 12$ cm

$$c^2 = 5^2 + 12^2 = 25 + 144 = 169$$

$$c = \sqrt{169} = 13 \text{ cm}$$

Verification: $(5, 12, 13)$ is a well-known Pythagorean triple. $5^2 + 12^2 = 25 + 144 = 169 = 13^2$ ✓

Why other options are wrong:

- Q31.**
- **Option A:** 10 cm: $5^2 + 12^2 = 169 \neq 100 = 10^2$.
 - **Option B:** 13 cm — correct.
 - **Option C:** 15 cm: $15^2 = 225 \neq 169$.
 - **Option D:** 17 cm: $17^2 = 289 \neq 169$.

Final Answer: Hypotenuse = 13 cm $\Rightarrow$ (B)

Answer: (B) [↑ Go back to Q 31](#)

Solution

Concept — Quadrilateral Hierarchy:

A rectangle has all four angles equal to 90° and opposite sides equal. A square has all four sides equal AND all four angles equal to 90° , making it a special rectangle.

Solution:

A square satisfies all properties of a rectangle (four right angles, opposite sides equal). Additionally, all four sides of a square are equal. Therefore, a square is a **special type of Rectangle**.

Why other options are wrong:

- Q32.**
- **Option A:** Trapezium has only one pair of parallel sides; a square has two.
 - **Option B:** A square is also a rhombus, but *rhombus only* is incorrect because it is also a rectangle.
 - **Option C:** Rectangle — correct (most precise standard answer for this level).
 - **Option D:** Kite has two pairs of adjacent equal sides, not all four equal.

Final Answer: A square is a special type of Rectangle $\Rightarrow$ (C)

Answer: (C) [↑ Go back to Q 32](#)

Solution

Concept — Perpendicular Lines:

Two lines (or line segments) are perpendicular if they meet (or intersect) at a right angle, i.e., the angle between them is exactly 90° .



Solution:

By definition, perpendicular lines form a 90° angle at their point of intersection. This is denoted by a small square symbol at the vertex.

Why other options are wrong:

- Q33.**
- **Option A:** 90° — correct.
 - **Option B:** 180° means the lines are collinear (form a straight line), not perpendicular.
 - **Option C:** 45° is the angle bisector direction of a right angle, not perpendicularity.
 - **Option D:** 360° is a full rotation; not a geometric angle between two lines.

Final Answer: Perpendicular lines meet at $90^\circ \Rightarrow$ **(A)**

Answer: (A) [↑ Go back to Q 33](#)

Solution**Concept — Shortest Distance (Pythagoras' Theorem):**

When an object moves East then North, it traces two legs of a right triangle. The straight-line (shortest) distance is the hypotenuse.

Solution:

East distance = 3 km (horizontal leg), North distance = 4 km (vertical leg).

$$\text{Shortest distance} = \sqrt{3^2 + 4^2} = \sqrt{9 + 16} = \sqrt{25} = 5 \text{ km}$$

Note: (3, 4, 5) is the classic Pythagorean triple.

Why other options are wrong:

- Q34.**
- **Option A:** 7 km = 3 + 4, the total walking distance, not the straight-line distance.
 - **Option B:** 3 km is only the East leg.
 - **Option C:** 4 km is only the North leg.
 - **Option D:** 5 km — correct.

Final Answer: Shortest distance = 5 km $\Rightarrow$ **(D)**

Answer: (D) [↑ Go back to Q 34](#)

Solution**Concept — Perimeter of a Semicircle:**

A semicircle's perimeter consists of the curved arc (half the circumference) plus the diameter.



$$P = \pi r + d = \pi r + 2r$$

Solution:

Diameter = 14 cm, so radius $r = 7$ cm.

$$\text{Curved arc} = \pi r = \frac{22}{7} \times 7 = 22 \text{ cm}$$

Straight edge (diameter) = 14 cm

$$\text{Total perimeter} = 22 + 14 = 36 \text{ cm}$$

Why other options are wrong:

- Q35.**
- **Option A:** 22 cm is only the arc length, excluding the diameter.
 - **Option B:** 36 cm — correct.
 - **Option C:** 44 cm = $2\pi r = \pi d$: full circumference, not semicircle perimeter.
 - **Option D:** 66 cm: corresponds to $\pi \times 14 + 14 \times 2$ using wrong values.

Final Answer: Perimeter of semicircle = 36 cm $\Rightarrow$ **(B)**

Answer: (B) [↑ Go back to Q 35](#)

Solution

Concept — Area of Composite Figures:

Divide the composite figure into simpler shapes (rectangle and triangle), find each area, then add.

Solution:

$$\text{Area of rectangle} = \text{length} \times \text{width} = 20 \times 12 = 240 \text{ cm}^2$$

$$\text{Area of triangle} = \frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2} \times 20 \times 8 = 80 \text{ cm}^2$$

$$\text{Total area} = 240 + 80 = 320 \text{ cm}^2$$

Why other options are wrong:

- Q36.**
- **Option A:** 240 cm²: only the rectangle area, triangle not included.
 - **Option B:** 280 cm²: adds only 40 cm² (half of 80) for the triangle.
 - **Option C:** 320 cm² — correct.
 - **Option D:** 360 cm²: adds full triangle base $\times$ height ($20 \times 8 = 160$) instead of half.

Final Answer: Total area = 320 cm² $\Rightarrow$ **(C)**

Answer: (C) [↑ Go back to Q 36](#)



Solution**Concept — Surface Area of a Cube:**

A cube has 6 equal square faces. Total Surface Area = $6s^2$, where s is the side length.

Solution:

$$6s^2 = 294$$

$$s^2 = \frac{294}{6} = 49$$

$$s = \sqrt{49} = 7 \text{ cm}$$

$$\text{Verification: } 6 \times 7^2 = 6 \times 49 = 294 \checkmark$$

Why other options are wrong:

- Q37.**
- **Option A:** 7 cm — correct.
 - **Option B:** 6 cm: $6 \times 36 = 216 \neq 294$.
 - **Option C:** 8 cm: $6 \times 64 = 384 \neq 294$.
 - **Option D:** 49 cm: 49 is s^2 , not s .

Final Answer: Side of cube = 7 cm $\Rightarrow$ (A)

Answer: (A) [↑ Go back to Q 37](#)

Solution**Concept — Area of Path Around a Rectangle:**

The path surrounds the garden outside. The outer rectangle has dimensions $(L + 2w) \times (B + 2w)$ where w is the path width.

Solution:

Garden: 80 m $\times$ 50 m, Path width = 4 m.

$$\begin{aligned} \text{Outer rectangle: } (80 + 8) \times (50 + 8) &= 88 \times 58 \\ &= 88 \times 58 = 5104 \text{ m}^2 \end{aligned}$$

$$\text{Inner (garden) area} = 80 \times 50 = 4000 \text{ m}^2$$

$$\text{Path area} = 5104 - 4000 = 1104 \text{ m}^2$$

Why other options are wrong:

- Q38.**
- **Option A:** 720 m²: uses path width 3 m on each side.
 - **Option B:** 880 m²: uses $84 \times 54 - 4000 = 4536 - 4000 = 536$? No; different error.
 - **Option C:** 960 m²: error in outer dimension computation.
 - **Option D:** 1104 m² — correct.

Final Answer: Path area = 1104 m² $\Rightarrow$ (D)



Answer: (D) [↑ Go back to Q 38](#)

Solution

Concept — Area and Cost Calculation:

Area of the room = length $\times$ width. Total cost = Area $\times$ Cost per m^2 .

Solution:

Area of room = $8 \times 5 = 40 \text{ m}^2$

Cost per $\text{m}^2 = \text{Rs. } 120$

Total cost = $40 \times 120 = 4800$

Why other options are wrong:

- Q39.**
- **Option A:** Rs. 2400 = 20×120 : uses half the area.
 - **Option B:** Rs. 3600 = 30×120 : uses wrong area.
 - **Option C:** Rs. 4800 — correct.
 - **Option D:** Rs. 6000 = 50×120 : uses $8 + 5 = 13 \approx 50$? Incorrect area.

Final Answer: Total carpet cost = Rs. 4800 $\Rightarrow$ (C)

Answer: (C) [↑ Go back to Q 39](#)

Solution

Concept — Diagonal of a Rectangle:

By Pythagoras' theorem, diagonal $d = \sqrt{L^2 + W^2}$.

Solution:

$L = 40 \text{ m}, W = 30 \text{ m}$

$d = \sqrt{40^2 + 30^2} = \sqrt{1600 + 900} = \sqrt{2500} = 50 \text{ m}$

Note: (30, 40, 50) is a Pythagorean triple (multiple of 3, 4, 5).

Why other options are wrong:

- Q40.**
- **Option A:** 35 m: $35^2 = 1225 \neq 2500$.
 - **Option B:** 50 m — correct.
 - **Option C:** 70 m: $70^2 = 4900 \neq 2500$.
 - **Option D:** 10 m = $|40 - 30|$; subtracting sides gives no geometric meaning for diagonal.

Final Answer: Diagonal = 50 m $\Rightarrow$ (B)

Answer: (B) [↑ Go back to Q 40](#)



Solution**Concept — Ratio and Proportion:**

If cement:sand = 1 : 3, then for every 1 part cement, there are 3 parts sand.

Solution:

Cement used = 5 kg.

$$\frac{\text{Sand}}{\text{Cement}} = \frac{3}{1}$$

$$\text{Sand} = 3 \times 5 = 15 \text{ kg}$$

Why other options are wrong:

- Q41.**
- **Option A:** 3 kg: equals the ratio number, not the actual sand quantity.
 - **Option B:** 5 kg: equals the cement quantity; would mean 1 : 1 ratio.
 - **Option C:** 15 kg — correct.
 - **Option D:** 20 kg: would correspond to a 1 : 4 ratio.

Final Answer: Sand needed = 15 kg $\Rightarrow$ (C)

Answer: (C) [↑ Go back to Q 41](#)

Solution**Concept — Unitary Method / Direct Proportion:**

If 24 cookies need 2 cups sugar, then 1 cookie needs $\frac{2}{24}$ cups. For 60 cookies, multiply by 60.

Solution:

Sugar for 24 cookies = 2 cups.

$$\text{Sugar for 1 cookie} = \frac{2}{24} \text{ cups.}$$

$$\text{Sugar for 60 cookies} = \frac{2}{24} \times 60 = \frac{120}{24} = 5 \text{ cups.}$$

Why other options are wrong:

- Q42.**
- **Option A:** 5 cups — correct.
 - **Option B:** 4 cups: would make 48 cookies, not 60.
 - **Option C:** 6 cups: would make 72 cookies, not 60.
 - **Option D:** 3 cups: would make 36 cookies, not 60.

Final Answer: Sugar needed for 60 cookies = 5 cups $\Rightarrow$ (A)

Answer: (A) [↑ Go back to Q 42](#)



Solution**Concept — Finding the Whole from a Fractional Part:**

If $\frac{2}{3}$ of a number is given, multiply by $\frac{3}{2}$ to find the whole number.

Solution:

Let the number be n .

$$\frac{2}{3} \times n = 48 \Rightarrow n = 48 \times \frac{3}{2} = 72$$

Now find $\frac{3}{4}$ of 72:

$$\frac{3}{4} \times 72 = \frac{216}{4} = 54$$

Why other options are wrong:

- Q43.**
- **Option A:** 48 is $\frac{2}{3}$ of the number, not $\frac{3}{4}$ of it.
 - **Option B:** $64 = \frac{3}{4} \times 85.3$; incorrect base number.
 - **Option C:** $36 = \frac{1}{2} \times 72$; uses $\frac{1}{2}$ instead of $\frac{3}{4}$.
 - **Option D:** 54 — correct.

Final Answer: $\frac{3}{4}$ of the number = 54 $\Rightarrow$ **(D)**

Answer: (D) [↑ Go back to Q 43](#)

Solution**Concept — Ratio and Ages:**

If father:son = 5 : 2, then son's age = $\frac{2}{5} \times$ father's age.

Solution:

Father's age = 35 years.

$$\text{Son's age} = \frac{2}{5} \times 35 = \frac{70}{5} = 14 \text{ years.}$$

Verification: Ratio 35 : 14 = 5 : 2 ✓

Why other options are wrong:

- Q44.**
- **Option A:** $7 = \frac{1}{5} \times 35$; uses ratio $\frac{1}{5}$ instead of $\frac{2}{5}$.
 - **Option B:** 14 years — correct.
 - **Option C:** $21 = \frac{3}{5} \times 35$; uses ratio 3 : 5 instead of 2 : 5.
 - **Option D:** $28 = \frac{4}{5} \times 35$; uses ratio 4 : 5 instead of 2 : 5.

Final Answer: Son's age = 14 years $\Rightarrow$ **(B)**

Answer: (B) [↑ Go back to Q 44](#)



Solution**Concept — Ratio of Parts in a Mixture:**

Mass of water = Total solution – Mass of salt. Ratio = salt : water.

Solution:

Salt = 30 g, Total solution = 120 g.

Water = 120 – 30 = 90 g.

$$\text{Ratio of salt to water} = 30 : 90 = \frac{30}{30} : \frac{90}{30} = 1 : 3$$

Why other options are wrong:

- Q45.**
- **Option A:** 1 : 3 — correct.
 - **Option B:** 1 : 4: would require water = 120 g and salt = 30 g, total = 150 g (not 120 g).
 - **Option C:** 3 : 1: reverses salt and water.
 - **Option D:** 30 : 120: ratio of salt to the whole solution (not to water), and not simplified.

Final Answer: Salt : Water = 1 : 3 $\Rightarrow$ (A)**Answer:** (A) [↑ Go back to Q 45](#)**Solution****Concept — Simple Interest: Finding Time:**

$$SI = \frac{P \times R \times T}{100}, \text{ so } T = \frac{SI \times 100}{P \times R}$$

Solution:Principal P = Rs. 5000, Amount = Rs. 7000SI needed = 7000 – 5000 = Rs. 2000, Rate R = 8% p.a.

$$T = \frac{2000 \times 100}{5000 \times 8} = \frac{200000}{40000} = 5 \text{ years}$$

Why other options are wrong:

- Q46.**
- **Option A:** 2 years: $SI = \frac{5000 \times 8 \times 2}{100} = \text{Rs. } 800$; Amount = Rs. 5800 $\neq$ 7000.
 - **Option B:** 3 years: $SI = \text{Rs. } 1200$; Amount = Rs. 6200 $\neq$ 7000.
 - **Option C:** 4 years: $SI = \text{Rs. } 1600$; Amount = Rs. 6600 $\neq$ 7000.
 - **Option D:** 5 years — correct.

Final Answer: Time = 5 years $\Rightarrow$ (D)**Answer:** (D) [↑ Go back to Q 46](#)

Solution**Concept — Comparing Simple Interest Earned:**

$SI = \frac{P \times R \times T}{100}$. Compute SI for each investor and find the difference.

Solution:

Ramesh: $P = \text{Rs. } 2000$, $R = 5\%$, $T = 2$ years.

$$SI_{\text{Ramesh}} = \frac{2000 \times 5 \times 2}{100} = \frac{20000}{100} = \text{Rs. } 200$$

Suresh: $P = \text{Rs. } 3000$, $R = 4\%$, $T = 2$ years.

$$SI_{\text{Suresh}} = \frac{3000 \times 4 \times 2}{100} = \frac{24000}{100} = \text{Rs. } 240$$

$$\text{Difference} = 240 - 200 = 40$$

Why other options are wrong:

- Q47.**
- **Option A:** Rs. 80: incorrectly doubles the difference.
 - **Option B:** Rs. 60: uses wrong interest rates.
 - **Option C:** Rs. 40 — correct.
 - **Option D:** Rs. 20: halves the correct answer.

Final Answer: Difference in SI = Rs. 40 $\Rightarrow$ (C)

Answer: (C) [↑ Go back to Q 47](#)

Solution**Concept — Mode of a Data Set:**

The mode is the value that appears most frequently in the data set.

Solution:

Data: 45, 52, 38, 67, 45, 55, 62, 45

Tally of frequencies: 38 $\rightarrow$ 1, 45 $\rightarrow$ 3, 52 $\rightarrow$ 1, 55 $\rightarrow$ 1, 62 $\rightarrow$ 1, 67 $\rightarrow$ 1

The value 45 appears **3 times** — the highest frequency.

$$\text{Mode} = 45$$

Why other options are wrong:

- Q48.**
- **Option A:** 45 — correct (appears 3 times).
 - **Option B:** 52 appears only once.
 - **Option C:** 55 appears only once.
 - **Option D:** 62 appears only once.

Final Answer: Mode = 45 $\Rightarrow$ (A)

Answer: (A) [↑ Go back to Q 48](#)



Solution**Concept — Median of a Data Set:**

Sort the data in ascending order. For an even number of values, median = $\frac{\text{middle two values sum}}{2}$.

Solution:

Data: 12, 8, 20, 15, 10, 18, 25, 6

Sorted: 6, 8, 10, 12, 15, 18, 20, 25

$n = 8$ (even). Middle two values: 4th = 12 and 5th = 15.

$$\text{Median} = \frac{12 + 15}{2} = \frac{27}{2} = 13.5$$

Why other options are wrong:

- Q49.**
- **Option A:** 12 is the 4th value, not the median of an 8-element set.
 - **Option B:** 13.5 — correct.
 - **Option C:** 15 is the 5th value, not the median.
 - **Option D:** 16: error in computing the average of 12 and 15.

Final Answer: Median = 13.5 $\Rightarrow$ **(B)**

Answer: (B) [↑ Go back to Q 49](#)

Solution**Concept — Reading a Bar Graph and Finding Total:**

Read each bar's value from the graph and add all values to find the total.

Solution:

From the bar graph:

- Q50.**
- January: Rs. 2000
 - February: Rs. 1500
 - March: Rs. 2500
 - April: Rs. 3000
 - May: Rs. 2000

$$\text{Total savings} = 2000 + 1500 + 2500 + 3000 + 2000 = 11,000$$

Why other options are wrong:

- **Option A:** Rs. 3,000: this is only April's savings, the highest single month.
- **Option B:** Rs. 5,000: might be the sum of only two months.
- **Option C:** Rs. 8,000: partial sum (leaves out some months).
- **Option D:** Rs. 11,000 — correct.

Final Answer: Total savings = Rs. 11,000 $\Rightarrow$ **(D)**



Answer: (D) [↑ Go back to Q 50](#)



Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	B	2	D	3	A	4	C	5	B
6	D	7	C	8	A	9	C	10	B
11	A	12	D	13	B	14	C	15	A
16	D	17	B	18	C	19	D	20	A
21	C	22	B	23	A	24	D	25	C
26	B	27	A	28	C	29	A	30	D
31	B	32	C	33	A	34	D	35	B
36	C	37	A	38	D	39	C	40	B
41	C	42	A	43	D	44	B	45	A
46	D	47	C	48	A	49	B	50	D

