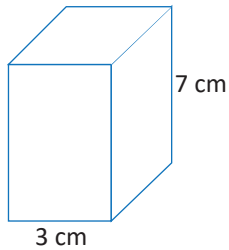


GRADE 5-6 QUESTIONS AND SOLUTIONS

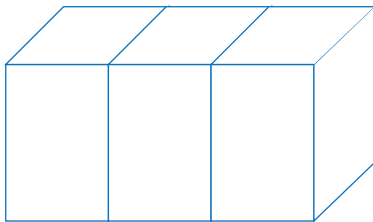
Q1: Bobby reads 60 pages of a book on the first day. On the second day, he reads 30 pages more than the first day. On the third day, he finishes the book by reading 10 pages more than the second day. According to this, how many pages is this book? (1 points)

- A) 100 B) 160 C) 250 D) 340

Q2:



The rectangular prism below is formed by placing 3 of the above square prisms side by side.



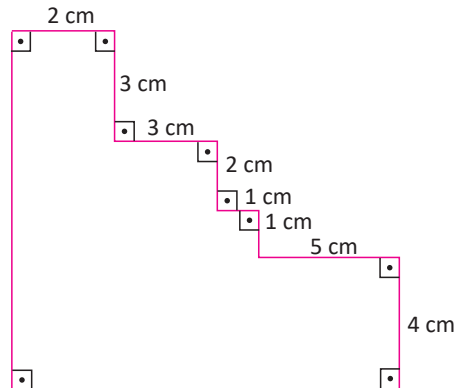
What is the surface area of this rectangular prism cm^2 ? (3 points)

- A) 206 B) 218 C) 222 D) 254

Q3: A ball dropped from a height of 8 meters rises to 0.2 times the height of its previous bounce after each fall. What is the total distance traveled by the ball after its third bounce? (4 points)

- A) 3,84 B) 8,64 C) 10,84 D) 11,84

Q4:



What is the perimeter of this compound shape? (6 points)

- A) 40 B) 42 C) 46 D) 48

Q5: Using the digits 3, 1, 6, and 9 each exactly once, what is 1 more than the smallest four-digit number that can be formed? (1 points)

- A) 3170 B) 1370
C) 6320 D) 9632

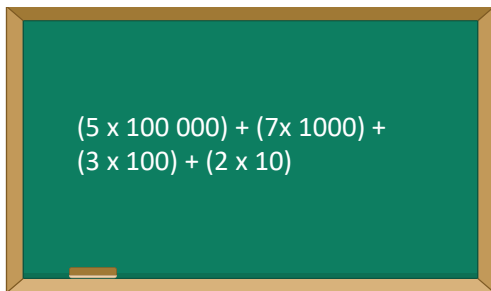
Q7:

$$\begin{array}{r} \text{A B} \\ \times \text{C D} \\ \hline 9 \text{ A} \\ + \text{A B} \\ \hline 3 \text{ 2 2} \end{array}$$

What is the value of $A + B + C + D$? (1 points)

- A) 10 B) 12 C) 14 D) 16

Q6:



Which of the following is the natural number that has been decomposed in the form above? (1 points)

- A) 570 302 B) 507 320
C) 570 320 D) 507 302

Q8: If the digit in the thousands place of a five-digit natural number is decreased by 2 and the digit in the ten thousands place is increased by 3, how the value of number will change? Choose the CORRECT. (1 points)

- A) increases by 1 000
B) decreases by 1 000
C) increases by 28 000
D) decreases by 28 000

GRADE 5-6 QUESTIONS AND SOLUTIONS

Q9:



What is the quotient in the division operation given above? (2 points)

- A) 11 B) 100 C) 101 D) 111

Q10:



A stationery store that sells 23 boxes, each containing 12 pencils, has paid 1656 dollars. How much does each pencil cost? (2 points)

- A) 3 B) 4 C) 6 D) 8

Q11: Which of the following cannot be the perimeter of a rectangle with side lengths that are prime numbers? (2 points)

- A) 20 B) 26 C) 32 D) 48

Q12: How many integers are there between -13 and 3? (2 points)

- A) 10 B) 15 C) 16 D) 17

Q13:

$$\begin{array}{r} 5149 \\ \times 498 \\ \hline 5 \bullet 4 \star \end{array}$$

What is the value of $\bullet + \star$? (2 points)

- A) 11 B) 12 C) 13 D) 14

Q14: Which option is wrong? (3 points)

- A) $\frac{24}{3} = 8$ B) $\frac{27}{2} > 10$
 C) $11 < \frac{45}{4}$ D) $12 > \frac{59}{4}$

Q15: Lizzy's $\frac{3}{5}$ of her money is equal to $\frac{3}{8}$ of Richard's money. If Lizzy has 75 dollars, how much money does Richard have? (3 points)

- A) 120 B) 135 C) 150 D) 180

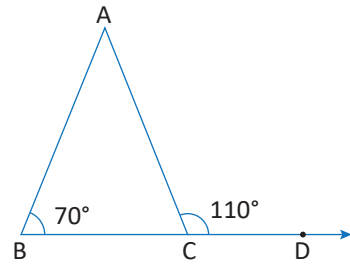
Q16:



55% of the 1800 students in a school are male. How many students are female? (3 points)

- A) 630 B) 720 C) 810 D) 900

Q17:



In the figure, triangle ABC has $m(\widehat{ABC}) = 70^\circ$ and $m(\widehat{ACD}) = 110^\circ$.

Given that points B, C, and D are collinear, what is the measure of $m(\widehat{BAC})$? (3 points)

- A) 30 B) 40 C) 50 D) 60

Q18:



A triangular plot of land with a perimeter of 96 meters will have trees planted along its perimeter at equal intervals, with the condition that the trees must be located at the vertices of the triangle as well. How many trees are needed at a minimum? (4 points)

- A) 20 B) 23 C) 24 D) 25

GRADE 5-6 QUESTIONS AND SOLUTIONS

19: $5\frac{7}{8} - 2\frac{1}{5} - 1\frac{4}{5} = \frac{4}{5}$

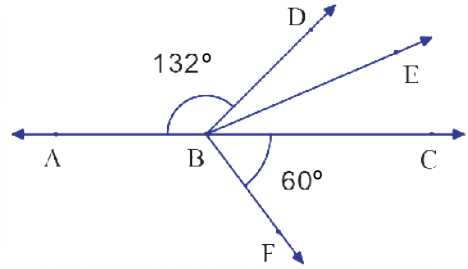
Find the value of A (4 points)

- A) 1 B) 5 C) 7 D) 8

Q20: A lift that can carry a maximum of 250 kg has a box with a mass of $(x + 80)(x + 80)(x + 80)$ kg placed in it. How many more kilograms can be added to the lift at most? (4 points)

- A) $170 + x$ B) $330 - x$
 C) $170 - x$ D) $180 + x$

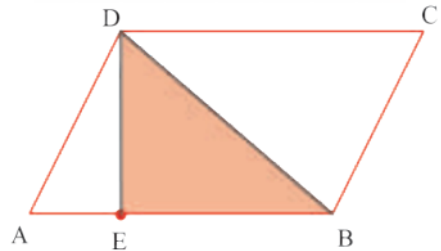
Q21:



Points A, B, and C given in the figure are collinear. Since \overline{BE} is perpendicular to \overline{BF} , what is the measure of $\angle EBD$? (4 points)

- A) 12 B) 18 C) 32 D) 56

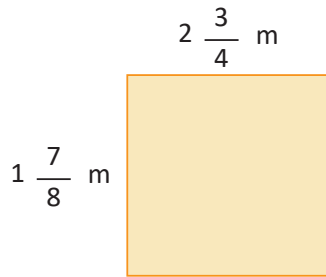
Q22:



What is the area of ABCD? (5 points)

- A) 80 B) 120 C) 160 D) 170

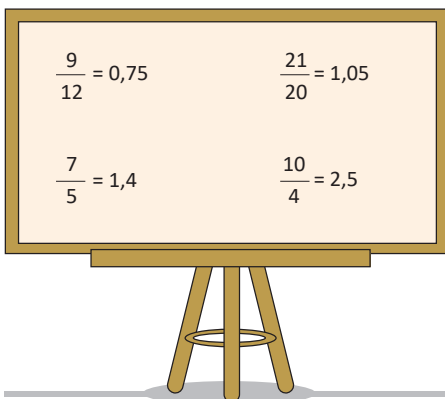
Q23:



What is the perimeter of this rectangle?
(5 points)

- A) $8 \frac{1}{8}$ B) $8 \frac{1}{4}$
C) $9 \frac{1}{8}$ D) $9 \frac{1}{4}$

Q24:



How many of the equalities given above are correct? (5 points)

- A) 1 B) 2 C) 3 D) 4

Q25:



A computer with a sticker price of 1800 euros is sold with 25% paid upfront and the remaining amount divided into 9 equal installments. How much is each installment that the customer has to pay? (5 points)

- A) 120 B) 135 C) 150 D) 165

Q26:

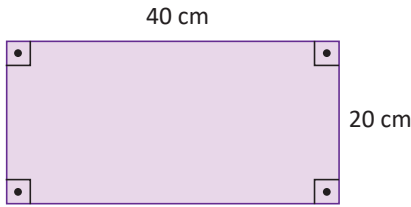
- The opposite sides are parallel.
- The sum of the interior angles is 360° .
- The lengths of the diagonals are not equal.
- The diagonals are perpendicular to each other.
- The diagonals bisect each other.

Which polygon do the above properties belong to? (5 points)

- A) Square
B) Rectangle
C) Rhombus
D) Parallelogram

GRADE 5-6 QUESTIONS AND SOLUTIONS

Q27:



If the length of the longer side of the rectangle given above is decreased by 20%, and the length of the shorter side is increased by 10%, how does the perimeter change? (6 points)

- A) Increased by 6
- B) Increased by 10
- C) Decreased by 12
- D) Constant

Q28: In a school, there are five classes before the lunch break and four classes after the lunch break. Each class is 40 minutes long. There are 10-minute breaks between each class. The lunch break is 45 minutes long. If a student starts the first class at 09:00, what time does the student leave the school? (6 points)

- A) 4.55 pm
- B) 5.05 pm
- C) 5.15 pm
- D) 5.30 pm

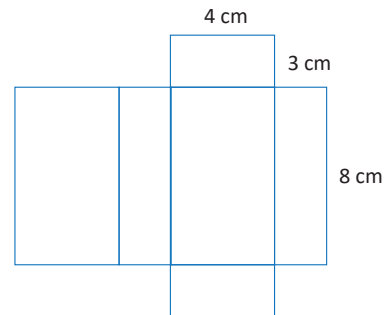
Q29:



Which two of the squares with the given colors, if removed, would prevent the remaining pieces from forming a cube? (6 points)

- A) green – brown
- B) blue – purple
- C) yellow – red
- D) green – purple

Q30:



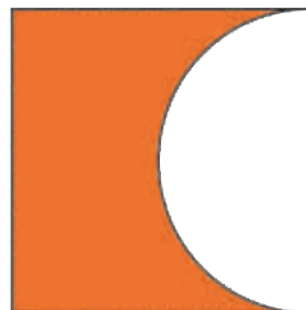
What is the surface area of the rectangular prism shown in the unfolded figure above, in cm^2 ? (6 points)

- A) 118
- B) 124
- C) 136
- D) 150

Q31: If the length of an edge of a cube-shaped box with a base area of 144 cm^2 is increased by 25%, by how many cubic centimeters does the volume increase? (7 points)

- A) 1480 B) 1568
C) 1647 D) 1982

Q33:

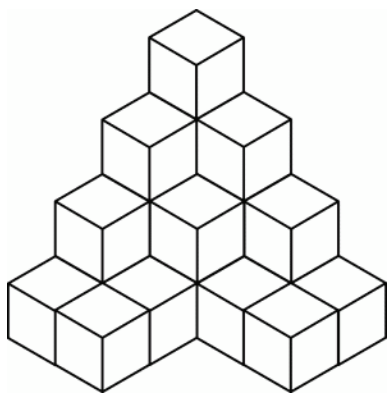


A circular segment, whose diameter is equal to one side of a square with a perimeter of 24 cm, is cut out from the square. What is the perimeter of the remaining part?

(Take π as 3.) (7 points)

- A) 21 B) 24 C) 27 D) 30

Q32:

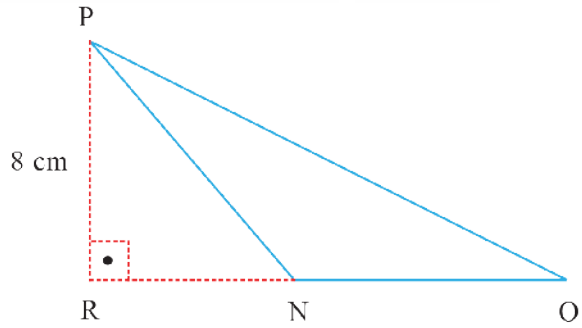
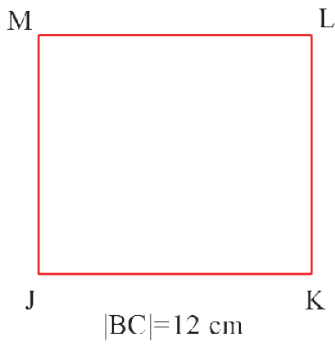


How many unit cubes are there in this shape? (7 points)

- A) 18 B) 22 C) 24 D) 30

GRADE 5-6 QUESTIONS AND SOLUTIONS

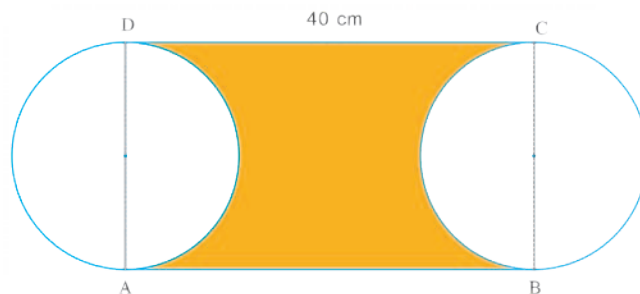
Q34:



If the area of the square JKLM and the area of the triangle ONP given above are equal, what is the length of ON in cm? (7 points)

- A) 9 B) 12 C) 16 D) 36

Q35:



In the figure above, the rectangle ABCD and two circles with diameters AD and BC are given. If $|DC|=40\text{ cm}$ and $|BC|=24\text{ cm}$ in the figure above, what is the perimeter of the shaded region? ($\pi = 3$) (7 points)

- A) 148 B) 152 C) 163 D) 164

GRADE 5-6 QUESTIONS AND SOLUTIONS

ANSWER IS C

SOLUTION:

Q1: Bobby reads 60 pages of a book on the first day. On the second day, he reads 30 pages more than the first day. It means he reads 90 pages on the second day. On the third day, he finishes the book by reading 10 pages more than the second day. It means that he reads 100 pages on the third day. To sum up, he read $60 + 90 + 100 = 250$ pages in three days and he finished the book. The book has 250 pages in total.

ANSWER IS C

SOLUTION:

Q2: As the object above is square prism, the side lengths of top and bottom face are equal which is 3 cm.

Rectangular prism has 6 rectangular faces in which all the pairs of opposite faces are congruent.

Total surface area = $2(lw + wh + hl)$

$$2 \times (27 + 63 + 21) = 222 \text{ cm}^2$$

ANSWER IS D

SOLUTION:

Q3: To solve it, let's calculate the total distance traveled by the ball step-by-step.

The ball is dropped from a height of 8 meters.

After the first bounce, the ball rises to 0.2×8 meters = 1.6 meters.

The ball then falls again from this height.
Distance traveled downward: 1.6 meters.

After the second bounce, the ball rises to 0.2×1.6 meters = 0.32 meters.

The ball then falls again from this height.
Distance traveled downward: 0.32 meters.

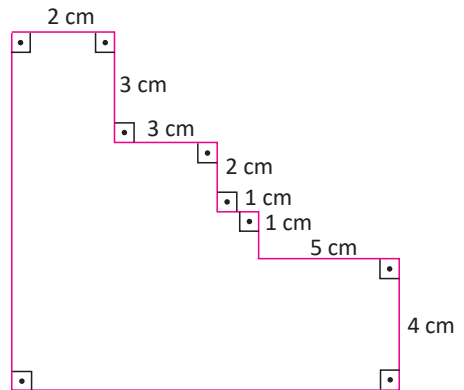
Adding these distances together:
Total distance = $8 + 3.2 + 0.64 = 11.84$ meters.

So, after the third bounce, the total distance traveled by the ball is 11.84 meters.

ANSWER IS B

SOLUTION:

Q4:



The opposite sides of the rectangle are equal in length. Therefore, the length of the compound shape will be the sum of all horizontal sides of it.

$$\text{Length} = 2 \text{ cm} + 3 \text{ cm} + 1 \text{ cm} + 5 \text{ cm} = 11 \text{ cm}$$

The width of the compound shape will be the sum of all vertical sides of it.

$$\text{Width} = 3 \text{ cm} + 2 \text{ cm} + 1 \text{ cm} + 4 \text{ cm} = 10 \text{ cm}$$

Add the lengths of all the outer edges.

Do not include the inner edges where shapes meet.

$$\text{Perimeter: } 11 \text{ cm} + 10 \text{ cm} + 2 \text{ cm} + 3 \text{ cm} + 3 \text{ cm} + 2 \text{ cm} + 1 \text{ cm} + 1 \text{ cm} + 5 \text{ cm} + 4 \text{ cm} = 42 \text{ cm}$$

ANSWER IS B

SOLUTION:

Q5: The smallest four-digit number that can be formed using the digits 3, 1, 6, and 9 is 1369. Adding 1 to this number gives 1370. So, the answer is 1370.

ANSWER IS B

SOLUTION:

Q6: $(5 \times 100\,000) = 500\,000$
 $(7 \times 1\,000) = 7\,000$
 $(3 \times 100) = 300$
 $(2 \times 10) = 20$
 $500\,000 + 7\,000 + 300 + 20 = 507\,320$

ANSWER IS A

SOLUTION:

Q7: From the question, we can say that $B \times D = A$ and $A \times D = 9$.
 $B \times C = B$ and $A \times C = A$. It means that C is 1.
 From the result, we can easily say that $A = 2$.
 $9 + B = 12$; so, B is 3.
 $23 \times D = 92$; so, D is 4.
 $A + B + C + D = 2 + 3 + 1 + 4 = 10$

ANSWER IS C

SOLUTION:

Q8: Let's denote the original five-digit number as N , which can be expressed as:

$N = 10000a + 1000b + 100c + 10d + e$ where:

- a is the digit in the ten thousands place
- b is the digit in the thousands place
- c is the digit in the hundreds place
- d is the digit in the tens place
- e is the digit in the ones place

According to the problem, if we decrease the digit in the thousands place by 2 and increase the digit in the ten thousands place by 3, the new number N' can be written as:

$N' = 10000(a + 3) + 1000(b - 2) + 100c + 10d + e$

Now, let's simplify this expression:

$N' = 10000a + 30000 + 1000b - 2000 + 100c + 10d + e$

$N' = (10000a + 1000b + 100c + 10d + e) + 30000 - 2000$

$N' = N + 28000$

So, the new number is the original number plus 28000.

ANSWER IS C

SOLUTION:

Q9: To find the quotient of $4747 \div 47$, you can perform the division:

$4747 \div 47 = 101$

So, the quotient is 101

ANSWER IS C

SOLUTION:

Q10: First, find the total number of pencils:

Total number of pencils = $23 \text{ boxes} \times 12 \text{ pencils per box} = 276 \text{ pencils}$

Next, calculate the cost per pencil:

Cost per pencil = $\text{Total payment} / \text{Total number of pencils} = 1656 \text{ dollars} / 276 \text{ pencils}$

Performing the division:

$\frac{1656}{276} = 6$

So, each pencil costs 6 dollars.

ANSWER IS B

SOLUTION:

Q11: Let the side lengths of the rectangle be two prime numbers, p and q . The perimeter P of the rectangle is given by $P = 2(p + q)$. To solve, check if each of the given options can be expressed as $2(p + q)$, where p and q are prime numbers.

Option 20:

$$20 = 2(p + q)$$

$$p + q = 10$$

Prime pairs adding up to 10 : $3 + 7 = 10$

So, 20 is possible.

Option 26:

$$26 = 2(p + q)$$

$$p + q = 13$$

Prime pairs adding up to 13 : $5 + 8$ (but 8 is not prime).

$7 + 6$ (but 6 is not prime).

No valid prime pairs add up to 13, so 26 is not possible.

Option 32:

$$32 = 2(p + q)$$

$$p + q = 16$$

Prime pairs adding up to 16: $3+13=16$

So, 32 is possible.

Option 48:

$$48 = 2(p + q)$$

$$p + q = 24$$

Prime pairs adding up to 24 : $5 + 19 = 24$

So, 48 is possible.

The only option that cannot be the perimeter is 26.

ANSWER IS B

SOLUTION:

Q12: The integers between -13 and 3 (exclusive) are: $-12, -11, -10, -9, -8, -7, -6, -5, -4, -3, -2, -1, 0, 1, 2$.

To count them, simply list or recognize that this is a sequence from -12 to 2 .

So, there are 15 integers between -13 and 3 .

ANSWER IS C

SOLUTION:

Q13: To find the missing elements, find the result of the addition operation first.

$$5149 + 498 = 5647$$

So, ● is 6 and ★ is 7. Their sum is 13.

ANSWER IS D

SOLUTION:

Q14: Option A: When 24 is divided by 3, the answer will be 8.

Option B: When the denominators of both fractions are equalized, the numerator 27 will be greater than 20.

Option C: When the denominators of both fractions are equalized, the numerator 45 will be greater than 44.

Option D: When the denominators of both fractions are equalized, the numerator 48 will be less than 59. However, in the option, $12 > 59/4$ is written incorrectly.

ANSWER IS A

SOLUTION:

Q15: Let Lizzy's total amount of money be L and Richard's total amount of money be R .

According to the problem:

$$\frac{3}{5} \times L = \frac{3}{8} \times R$$

Given $L = 75$ dollars, substitute into the equation:

$$\frac{3}{5} \times 75 = \frac{3}{8} \times R$$

Simplifying:

$$\frac{225}{5} = \frac{3}{8} \times R$$

$$45 = \frac{3}{8} \times R$$

To find R , multiply both sides by $\frac{8}{3}$:

$$R = 45 \times \frac{8}{3} = 120$$

So, Richard has 120 dollars.

ANSWER IS C

SOLUTION:

Q16: Find the number of male students:

$$\begin{aligned} \text{Number of male students} &= \frac{55}{100} \times 1800 \\ &= 0.55 \times 1800 = 990 \end{aligned}$$

To find the number of female students, subtract the number of male students from the total number of students:

$$\text{Number of female students} = 1800 - 990 = 810$$

So, there are 810 female students in the school.

ANSWER IS B

SOLUTION:

Q17: Since B, C, and D are collinear, \widehat{ACD} and \widehat{ABC} form a linear pair and add up to 180° .

Find the measure of \widehat{BCD} :

$$\widehat{BCD} - \widehat{ACD} = 180^\circ - 110^\circ = 70^\circ$$

Since ABC is a triangle, the sum of interior angles of triangle is 180° .

$$\widehat{ABC} + \widehat{ACB} = 70^\circ + 70^\circ = 140^\circ$$

$$180^\circ - 140^\circ = 40^\circ$$

ANSWER IS C

SOLUTION:

Q18: Find the missing side length: $36 \text{ m} + 28 \text{ m} + ? = 96 \text{ m}$

? is 32 m.

Find the HCF:

Prime factorizations:

$$36 : 36 = 2^2 \times 3^2$$

$$28 : 28 = 2^2 \times 7$$

$$32 : 32 = 2^5$$

Identify common prime factors:

- The only common prime factor is 2.

Find the lowest power of the common prime factor:

- For 36 and 28, the highest common power of 2 is 2^2
- For 32, the common power of 2 is 2^2

So, the HCF is $2^2 = 4$.

Use the HCF to Determine Number of Trees:

The HCF of 36, 28, and 32 meters is 4 meters. This means that the spacing interval of 4 meters will evenly divide each side of the triangle.

Calculate the number of intervals:

- Total Perimeter: 96 meters
- Interval Length: 4 meters
- Number of Intervals: $\frac{96}{4} = 24$
- Number of Trees: 24 intervals

Therefore, at least 24 trees are needed to plant them at equal intervals of 4 meters along the perimeter of the triangle.

ANSWER IS D

SOLUTION:

Q19: Convert mixed numbers to improper fractions:

- For $5\frac{3}{5}$: $5 + \frac{3}{5} = \frac{25}{5} + \frac{3}{5} = \frac{28}{5}$
- For $2\frac{1}{5}$: $2 + \frac{1}{5} = \frac{10}{5} + \frac{1}{5} = \frac{11}{5}$
- For $1\frac{4}{5}$: $1 + \frac{4}{5} = \frac{5}{5} + \frac{4}{5} = \frac{9}{5}$

Perform the subtraction:

$$\frac{28}{5} - \frac{11}{5} - \frac{9}{5} = ?$$

$$\frac{28 - 11 - 9}{5} = \frac{8}{5}$$

Find A:

The result of the subtraction is $\frac{8}{5}$

Therefore, $A = 8$.

ANSWER IS C

SOLUTION:

Q20: Maximum weight capacity of the lift: 250 kg

Calculate the weight of the box:

Weight of the box: $x + 80$ kg

Remaining capacity =

$$\begin{aligned} \text{Maximum weight capacity} - \text{Weight of the box} \\ = 250 - (x + 80) \end{aligned}$$

$$\text{Remaining capacity} = 250 - x - 80$$

$$\text{Remaining capacity} = 170 - x$$

So, the lift can carry $170 - x$ kilograms more at most.

ANSWER IS B

SOLUTION:

Q21: Since A, B, and C are collinear, \widehat{DBC} and \widehat{ABD} form a linear pair and add up to 180° .

Since \overline{BE} is perpendicular to \overline{BF} , \widehat{CBE} is 30° .

$$132^\circ + 30^\circ + \widehat{EBD} = 180^\circ$$

$$162^\circ + \widehat{EBD} = 180^\circ$$

$$\widehat{EBD} = 18^\circ$$

ANSWER IS D

SOLUTION:

Q22: Since the area of the triangle is given, we can find the height of the triangle.

$$A = \frac{1}{2} \times b \times h = \frac{1}{2} \times 12 \times h = 60 \text{ cm}^2$$

$$6 \times h = 60 \text{ cm}^2$$

So, the height is 10 cm.

The formula of the area of parallelogram is:

$$A = b \times h$$

base: 17 cm

height: 10 cm

$$A = 17 \times 10 = 170 \text{ cm}^2$$

ANSWER IS D

SOLUTION:

Q23: Perimeter = $2 \times (\text{Length} + \text{Width})$

Given:

- Length: $2\frac{3}{4}$

- Width: $1\frac{7}{8}$

Convert mixed numbers to improper fractions:

$$\text{Length: } \frac{11}{4}$$

$$\text{Width: } \frac{15}{8}$$

Find the sum of the length and width:

To add $\frac{11}{4}$ and $\frac{15}{8}$, find a common denominator.

The least common denominator of 4 and 8 is 8.

Convert $\frac{11}{4}$ to a fraction with denominator 8:

$$\frac{11}{4} \times 2 = \frac{22}{8}$$

Add the fractions:

$$\frac{22}{8} + \frac{15}{8} = \frac{37}{8}$$

Calculate the perimeter:

$$\text{Perimeter} = 2 \times \frac{37}{8} = \frac{74}{8} = 9\frac{1}{4}$$

So, the perimeter of the rectangle is $9\frac{1}{4}$ units

ANSWER IS D

SOLUTION:

Q24: Equation 1 $\Rightarrow \frac{9}{12} = \frac{3}{4} = 0.75$

Equation 2 $\Rightarrow \frac{21}{20} = 1\frac{1}{20} = 1.05$

Equation 3 $\Rightarrow \frac{7}{5} = 1\frac{2}{5} = 1.4$

Equation 4 $\Rightarrow \frac{10}{4} = 2\frac{1}{2} = 2.5$

Therefore, all of these equalities are correct.

ANSWER IS C

SOLUTION:

Q25: Calculate the upfront payment: The upfront payment is 25% of the total price.

Upfront payment = 0.25×1800 euros = 450 euros

Calculate the remaining amount to be paid in installments:

Remaining amount = Total price – Upfront payment

Remaining amount = $1800 - 450 = 1350$ euros

Divide the remaining amount into 9 equal installments:

Installment amount = $\frac{1350}{9} = 150$ euros

So, each installment that the customer has to pay is 150 euros.

ANSWER IS C

SOLUTION:

Q26: Opposite sides are parallel: This indicates that the polygon is a type of parallelogram.

1. The sum of the interior angles is 360° : This sum of the interior angles corresponds to a quadrilateral.
2. The lengths of the diagonals are not equal: In a parallelogram, the diagonals are not necessarily equal in length (except in the special case of a rectangle or square).
3. The diagonals are perpendicular to each other: This is a specific property of a rhombus (a type of parallelogram).
4. The diagonals bisect each other: This is another property of parallelograms.

Given all these properties, the polygon described is a rhombus.

A rhombus is a special type of parallelogram where:

- Opposite sides are parallel.
- The sum of the interior angles is 360° .
- The diagonals are perpendicular to each other.
- The diagonals bisect each other.
- The diagonals are not necessarily equal in length.

So, the polygon with the given properties is a rhombus.

ANSWER IS C

SOLUTION:

Q27: Initial Perimeter Calculation:

The perimeter P of a rectangle is given by:

$$P = 2 \times (\text{Length} + \text{Width})$$

So, the initial perimeter is:

$$P_{\text{initial}} = 2 \times (40 + 20) = 2 \times 60 = 120 \text{ cm}$$

Changes to Dimensions:

Decrease the length by 20%:

New length L^1 :

$$L^1 = 40 - (0.20 \times 40) = 40 - 8 = 32 \text{ cm}$$

Increase the width by 10%:

New width W^1 :

$$W^1 = 20 + (0.10 \times 20) = 20 + 2 = 22 \text{ cm}$$

New Perimeter Calculation:

The new perimeter P_{new} with the updated dimensions is:

$$P_{\text{new}} = 2 \times (L^1 + W^1) = 2 \times (32 + 22) = 2 \times 54 = 108 \text{ cm}$$

Change in Perimeter:

The change in the perimeter is:

$$\text{Change} = P_{\text{new}} - P_{\text{initial}} = 108 - 120 = -12 \text{ cm}$$

So, the perimeter decreases by 12 cm.

ANSWER IS A

SOLUTION:

Q28: Calculate the total class time before lunch:

- Number of classes before lunch: 5
- Duration of each class: 40 minutes
- Total class time before lunch:
 $5 \times 40 = 200$ minutes

Calculate the total break time before lunch:

- Number of breaks before lunch:
4 (one less than the number of classes)
- Duration of each break: 10 minutes
- Total break time before lunch:
 $4 \times 10 = 40$ minutes

Calculate the total time before lunch:

- Total time before lunch: Total class time before lunch + Total break time before lunch = $200 + 40 = 240$ minutes

Convert 240 minutes to hours and minutes:

$$240 \text{ minutes} = 4 \text{ hours}$$

Add the lunch break duration:

- Lunch break duration: 45 minutes

Calculate the total class time after lunch:

- Number of classes after lunch: 4
- Duration of each class: 40 minutes
- Total class time after lunch: $4 \times 40 = 160$ minutes

Calculate the total break time after lunch:

- Number of breaks after lunch: 3 (one less than the number of classes)
- Duration of each break: 10 minutes
- Total break time after lunch: $3 \times 10 = 30$ minutes

Calculate the total time after lunch:

- Total time after lunch: Total class time after lunch + Total break time after lunch = $160 + 30 = 190$ minutes

Convert 190 minutes to hours and minutes:

$$190 \text{ minutes} = 3 \text{ hours } 10 \text{ minutes}$$

Calculate the total time spent at school:

- Total time before lunch: 4 hours
- Lunch break: 45 minutes
- Total time after lunch: 3 hours 10 minutes

Add these together:

$$4 \text{ hours} + 45 \text{ minutes} + 3 \text{ hours} + 10 \text{ minutes} = 7 \text{ hours } 55 \text{ minutes}$$

Calculate the end time:

- Start time: 9:00 am
- Add total time: 7 hours 55 minutes

The end time is:

$$9:00 + 7 \text{ hours } 55 \text{ minutes} = 4.55 \text{ pm}$$

So, the student leaves the school at 4.55 PM

ANSWER IS C

SOLUTION:

Q29: Removing the red and yellow squares ensures that the remaining squares (pink, orange, green, blue, purple, and brown) cannot be folded into a shape with six connected faces. Removing these two disrupts the continuity of the net, preventing the remaining pieces from aligning into a cube.

ANSWER IS C

SOLUTION:

Q30: Surface Area of a rectangular prism = $2x$

$$(lh + wh + lw)$$

Length: 8 cm

Width: 4 cm

Height: 3 cm

Surface Area of a rectangular prism

$$= 2 \times (24 + 12 + 32) = 2 \times (68) = 136 \text{ cm}^2$$

ANSWER IS C

SOLUTION:

Q31: Find the length of an edge of the original cube:

Since the base area of the cube is 144 cm^2 , and the base of the cube is a square, we can find the length of one edge s using:

$$s^2 = 144 \text{ cm}^2 = 144$$

Solving for s :

$$s = \sqrt{144} = 12 \text{ cm}$$

Calculate the volume of the original cube:

The volume V of a cube is given by:

$$V = s^3$$

For the original cube:

$$V_{\text{original}} = 12^3 = 1728 \text{ cm}^3$$

Increase the length of the edge by 25%:

The new edge length s' is:

$$s' = s + 0.25s = 1.25s$$

$$s' = 1.25 \times 12 = 15 \text{ cm}$$

Calculate the volume of the new cube:

The volume V' of the new cube is:

$$V' = (s')^3 = 15^3 = 3375 \text{ cm}^3$$

Calculate the increase in volume:

The increase in volume ΔV is:

$$\Delta V = V' - V_{\text{original}}$$

$$\Delta V = 3375 - 1728 = 1647 \text{ cm}^3$$

So, the volume increases by 1647 cm^3 .

ANSWER IS B

SOLUTION:

Q32: To determine the number of unit cubes in the shape, let's count the cubes layer by layer from the bottom to the top.

Bottom Layer: The bottom layer has 12 cubes

Middle Layer: The middle layer has 9 cubes.

Top Layer: The top layer has 1 cube.

Total number of unit cubes: $12 + 9 + 1 = 22$ cubes

ANSWER IS C

SOLUTION:

Q33: Find the side length of the square:

The perimeter of the square is 24 cm. Since a square has four equal sides:

$$\text{Side length} = \frac{\text{Perimeter}}{4} = \frac{24}{4} = 6 \text{ cm}$$

Determine the circumference of the cut-out semicircle:

The side length of the square (6 cm) is also the diameter of the semicircle. The circumference of a full circle is given by:

$$C = \pi \times \text{Diameter}$$

For a semicircle, the curved part of the circumference is half of that:

$$\text{Curved part of semicircle} = \pi \times \frac{6}{2} = 3 \times 3 = 9 \text{ cm}$$

However, since the full perimeter of the semicircle includes the diameter (which is the side of the square):

$$\text{Total semicircle perimeter} = 9 \text{ cm (curved part)} + 6 \text{ cm (diameter)} = 15 \text{ cm}$$

But, since the diameter coincides with the side of the square, we only consider the curved part (9 cm) as the additional perimeter.

Calculate the remaining perimeter:

- The square initially has a perimeter of 24 cm.
- When the semicircle is cut out, the straight side along the square's edge remains, so we subtract the length of this side once and add the curved part of the semicircle.

$$\text{Remaining perimeter} = 24 \text{ cm} - 6 \text{ cm} + 9 \text{ cm} = 27 \text{ cm}$$

So, the perimeter of the remaining part is 27 cm.

ANSWER IS D

SOLUTION:

Q34: Find the area of the square JKLM:

The side length $|JK|$ (which is the same as $|BC|$) is given as 12 cm.

The area A_{square} of the square is:

$$A_{\text{square}} = \text{side} \times \text{side} = 144 \text{ cm}^2$$

Use the area equality to find $|NO|$:

Given that the area of the triangle ONP is equal to the area of the square JKLM, we have:

$$A_{\text{triangle}} = A_{\text{square}} = 144 \text{ cm}^2$$

The area of triangle ONP can be calculated using:

$$A_{\text{triangle}} = \frac{1}{2} \times \text{base} \times \text{height}$$

Here, the base $|RP|$ is given as 8 cm. The height corresponding to this base is $|NO|$.

$$\text{So, } \frac{1}{2} \times 8 \times |NO| = 144$$

Simplifying,

$$4 \times |NO| = 144$$

$$|NO| = 36 \text{ cm}$$

Final Answer:

The length of $|NO|$ is 36 cm.

ANSWER IS B

SOLUTION:

Q35: The shaded region's perimeter includes:

Two straight sides of the rectangle (AB and DC), each of length 40 cm.

Two semicircles, each with a diameter of 24 cm.

Straight Sides Contribution:

Length of AB and DC = $2 \times 40 \text{ cm} = 80 \text{ cm}$

Semicircles' Contribution:

The circumference of a full circle with a diameter of 24 cm is: Circumference = $\pi \times \text{Diameter}$

$$= 3 \times 24 \text{ cm} = 72 \text{ cm}$$

Since each semicircle is half of a full circle, the total contribution of the two semicircles is: Total Semicircle Length = $72/2 \text{ cm} + 72/2 \text{ cm}$

$$= 36 \text{ cm} + 36 \text{ cm} = 72 \text{ cm}$$

Calculate the Total Perimeter:

The total perimeter of the shaded region is the sum of the contributions from the straight sides and the semicircles:

$$\text{Total Perimeter} = 80 \text{ cm} + 72 \text{ cm} = 152 \text{ cm}$$

The perimeter of the shaded region is 152 cm.