Answers

1. **Answer: a**

Explanation:

To determine the letter on the face opposite to *M*

We analyze the two positions of the dice provided in the problem:

- **Position 1:** The visible letters are *S*, *T*, and *M*.
- **Position 2:** The visible letters are *T*, *P*, and *R*.

Step 1: Observing the common letter

In the two positions, *T* is visible in both views. This tells us that *T* is not on the opposite faces of *S*, *M*, *P*, or *R*.

Step 2: Determining adjacency

In Position 1, *S* and *M* are adjacent to *T*.
In Position 2, *P* and *R* are adjacent to *T*.
Therefore, *S*, *M*, *P*, and *R* cannot be opposite *T*.

Step 3: Matching opposites

Each face of the dice has a unique opposite face. Since *T* is not opposite *M*, the remaining faces *S*, *C*, *P*, and *R* must include the face opposite *M*.

Step 4: Identifying the opposite of *M*

From the arrangement:

- *S* and *M* are adjacent to *T*, so they are not opposites.
- *P* and *R* are adjacent to *T*, so they are not opposites.

This leaves *R* as the face opposite *M*.

Conclusion

The letter on the face opposite to *M* is **R**.

---

2. Answer: a

Explanation:

Identify the logical progression in the sequence of figures by analyzing geometric or rotational patterns. Replace the missing figure with the one that matches this sequence.

In this type of question we compare 2 with 3rd figure and 4th with 5th, so what so ever pattern you going to find in 2nd and 3rd just apply that on 4th and 5th.

---

3. Answer: d

Explanation:

The relationship involves opposites. 'Blossom' (to bloom) is the opposite of 'Wither' (to fade). Similarly, 'Stagnate' (to remain still) is opposite to 'Flow' (to move or progress).

---

4. Answer: b

Explanation:

Interchanging - and × gives the modified equation:

18 × 23 − 455 ÷ 7 + 28 = 377.

Solve step-by-step:

First, calculate 18 × 23 = 414. Then, 455 ÷ 7 = 65.

Subtract 65 from 414 to get 349,

and finally add 28 to get 377.

---

5. **Answer: d**

Explanation:

Given Equation

The original equation is: 4 − 12 + 3 ÷ 12 × 6 = ?

Operations are interchanged as follows:

- + is replaced by ÷
- ÷ is replaced by +
- × is replaced by −
- − is replaced by ×

Step 1: Substitute the New Operations

The rewritten equation becomes: 4 × 12 ÷ 3 + 12 − 6

Step 2: Follow the BODMAS Rule

We solve step by step:

1. **Division first:** 12 ÷ 3 = 4
2. **Substitute:** 4 × 4 + 12 − 6
3. **Multiplication:** 4 × 4 = 16
4. **Addition:** 16 + 12 = 28
5. **Subtraction:** 28 − 6 = 22

Final Answer

The result of the equation is: **22**.

6. **Answer: c**

Explanation:

Step 1: Write the Word in Alphabetical Order

The word **"PRANKED"** has the following letters: P, R, A, N, K, E, D.

Arranging these letters in alphabetical order gives: A, D, E, K, N, P, R.

Step 2: Compare the Positions

Original: P, R, A, N, K, E, D
Alphabetical: A, D, E, K, N, P, R

Step 3: Check for Unchanged Positions

Compare the letters at each position:

- The first letter in the original (P) becomes A, so it changes.
- The second letter (R) becomes D, so it changes.
- The third letter (A) becomes E, so it changes.
- The fourth letter (N) becomes K, so it changes.
- The fifth letter (K) becomes N, so it changes.
- The sixth letter (E) becomes P, so it changes.
- The seventh letter (D) becomes R, so it changes.

Step 4: Conclusion

None of the letters remain in their original positions.

7. **Answer: c**

Explanation:

Step 1: Analyze the Relationship

Observe the given examples:

- 10   15
- 42   63

The second number is obtained by multiplying the first number by **1.5**:

- 10 × 1.5 = 15
- 42 × 1.5 = 63
  Step 2: Apply the Same Logic to 22

Using the same relationship:

- 22 × 1.5 = 33

---

8. Answer: a

Explanation:

Count all the squares in the figure, including smaller squares, larger composite squares, and overlapping squares. The total is 14.

---

9. Answer: c

Explanation:

Step 1: Understand the Relationship

The relationship between **"Temerity"** and **"Shyness"** is one of opposites:

- **Temerity:** Boldness or excessive confidence.

- **Shyness:** The opposite of temerity.

Step 2: Apply the Same Logic to "Pique"

Pique means a feeling of irritation or resentment.

The opposite of **Pique** is **Delight**, which implies pleasure or satisfaction.

Final Answer

Option 3: Delight

---

10. **Answer: c**

Explanation:

Step 1: Identify the Repeating Segment

Observe the existing sequence:

- LMBA_
- HOLMBAC_
- OLM_
- ACHOL_
- BACHOL_

The repeating structure seems to be based on the sequence: **LMBACHO** .

Step 2: Fill in the Blanks

Using the repeating sequence **LMBACHO** :

- The 5th blank should be **C**.
- The 12th blank should be **H**.
- The 17th blank should be **B**.
- The 23rd blank should be **M**.
- The 30th blank should be **M**.

Final Answer

The letters are **C, H, B, M, M**, corresponding to **Option 3: CHBMM**.

---

11. **Answer: c**

Explanation:

Analyze the Given Example

Set 1: (7, 9, 48)

Observe the first two numbers: 7 and 9.

The third number, 48, is derived as:

- 7 × 9 − (7 + 9) = 63 − 15 = 48

Set 2: (6, 8, 42)

Using the same logic:

- 6 × 8 − (6 + 8) = 48 − 12 = 42

Apply the Logic to the Options

Option 1: (8, 10, 47)

- 8 × 10 − (8 + 10) = 80 − 18 = 62 ≠ 47

Option 2: (9, 11, 56)

- 9 × 11 − (9 + 11) = 99 − 20 = 79 ≠ 56

Option 3: (11, 13, 72)

- 11 × 13 − (11 + 13) = 143 − 26 = 72

Option 4: (10, 12, 54)

- 10 × 12 − (10 + 12) = 120 − 22 = 98 ≠ 54

Final Answer

Option 3: (11, 13, 72) matches the given pattern.

---

12. Answer: c

Explanation:

Explanation

The pattern among the options involves checking if the last number in each set is the product of the first two numbers:

Option 1: 2 - 4 - 8

2 × 4 = 8 (Follows the pattern)

Option 2: 2 - 2 - 4

2 × 2 = 4 (Follows the pattern)

Option 3: 3 - 2 - 5

3 × 2 = 6 ≠ 5 (Does NOT follow the pattern)

Option 4: 1 - 3 - 3

1 × 3 = 3 (Follows the pattern)

Conclusion

Option 3: 3 - 2 - 5 is the odd one out.

---

13. Answer: c

Explanation:

Based on the statements:

'Some cartons are utensils' implies 'Some papers are utensils' because all cartons are papers.

There is no direct information linking boxes to utensils, so conclusion (I) does not follow.

Conclusion (II) logically follows.

---

14. Answer: c

Explanation:

The relationship is: (First number – Second number) + Third number = 79 in the first set.

Similarly, in the third option: (66 – 45) + 49 = 79.

---

15. Answer: c

Explanation:

The word 'chair' appears in both phrases, and its code 'mi' is common to both sets of codes. Therefore, 'chair' is coded as 'mi'.

---

16. Answer: b

Explanation:

The correct mirror image can be identified by reflecting the given figure across the line MN. The positions of the elements and their orientation will flip horizontally.

17. **Answer: b**

Explanation:

Observe the pattern in the given series, such as **rotation, addition of new elements, or transformations**.

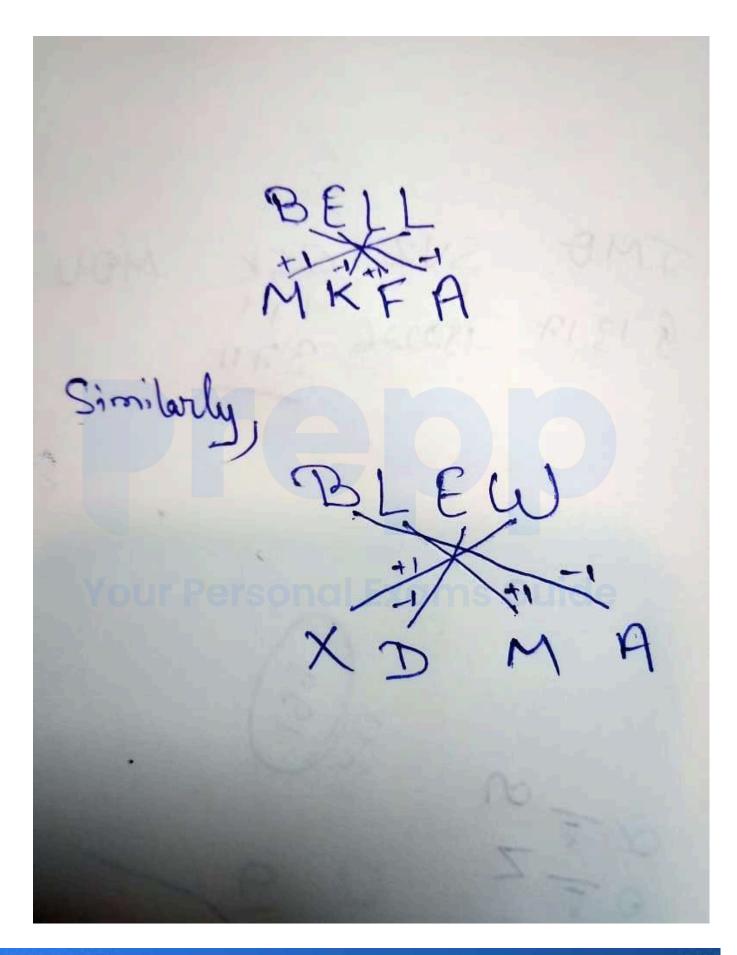Choose the option that aligns with this progression.

18. **Answer: d**

Explanation:

BELL

$+1$ -1 $+1$ -1

M K F A

Similarly,

BLEW

$+1$ -1 $+1$ -1

X D M A

Hence, XDMA is the correct answer.

---

19. Answer: c

Explanation:

Unfold the paper logically based on the cuts shown in the folded diagram.

The resulting figure will exhibit symmetry corresponding to the folding pattern.

---

20. Answer: c

Explanation:

Examine the Patterns in the Given Letter Clusters

LQV: The positions of the letters in the alphabet are:

- L = 12, Q = 17, V = 22

The difference between consecutive letters is +5 (12 17 22).

DIN: The positions of the letters are:

- D = 4, I = 9, N = 14

The difference between consecutive letters is +5 (4 9 14).

PTX: The positions of the letters are:

- P = 16, T = 20, X = 24

The difference between consecutive letters is +4 (16 20 24).

AFK: The positions of the letters are:

- A = 1, F = 6, K = 11

The difference between consecutive letters is +5 (1   6   11).

Odd One Out

All other clusters (**LQV**, **DIN**, **AFK**) have a difference of +5 between consecutive letters.

PTX has a difference of +4, making it the odd one out.

Final Answer

Option 3: PTX

---

21. Answer: d

Explanation:

The pattern involves decreasing the first letter by 4 alphabetically (Z → V → R → N → J), the second letter by 3 (V → S → P → M → J), the third letter by 2 (R → P → N → L → J), and the fourth letter by 1 (N → M → L → K → J). Thus, the missing cluster is NMLK.

---

22. Answer: b

Explanation:

The series increases progressively based on a pattern: $2^2, 4^2, 6^2, 8^2, 10^2$ difference between them is measured here so next will be 243.

---

23. Answer: c

Explanation:

Expression: P & Q % L # R & K

- **P & Q:** P is the wife of Q.
- **Q % L:** Q is the father of L.
- **L # R:** L is the sister of R.
- **R & K:** R is the wife of K.

Determine Q's Relationship to R

From the analysis:

- Q is the father of L.
- L is the sister of R.

Therefore, Q is also the father of R.

Final Answer

Option 3: Father

---

24. **Answer: a**

Explanation:

The pattern involves decreasing the first letter by 1 (F → E → D → C → B), the second letter by 1 (M → K → I → G → E), and subtracting 3 from the number (61 → 58 → 55 → 52 → 49). Thus, the missing term is BE49.

---

25. **Answer: d**

Explanation:

The correct mirror image can be determined by reflecting the given figure along the line MN. The orientation of all elements flips horizontally, maintaining symmetry.

---

26. **Answer: a**

Explanation:

The Jawaharlal Nehru Manipur Dance Academy, a premier institution for Manipuri dance, is located in Imphal, the capital city of Manipur.

---

27. **Answer: b**

Explanation:

The Tansen Music Festival is organized by the Government of Madhya Pradesh annually in Gwalior to honor the memory of Tansen, the legendary musician.

---

28. **Answer: c**

Explanation:

Champaran in Bihar was the site of Gandhi's first Satyagraha in 1917, aimed at addressing the plight of indigo farmers.

---

29. **Answer: a**

Explanation:

Hubbardia heptaneuron is an endangered species of grass native to certain regions and known for its ecological importance.

30. **Answer: a**

    Explanation:

    Karaikal, located on the Coromandel Coast, is geographically closer to Sri Lanka compared to the other options.

31. **Answer: c**

    Explanation:

    The Fifth Five-Year Plan (1974–1979) emphasized the "Garibi Hatao" (Eradicate Poverty) initiative as a core objective under the leadership of Indira Gandhi to address poverty and inequality in India.

32. **Answer: a**

    Explanation:

    The Directive Principles of State Policy are not personal or individualistic; they are aimed at promoting the collective welfare of society. The statement in Option 1 is incorrect.

33. **Answer: d**

    Explanation:

    Akbar was crowned as the Mughal emperor at Kalanaur in Punjab in 1556, following the death of his father, Humayun.

34. Answer: b

Explanation:

While relief, location, and distance from the sea significantly affect the climate of a place, the type of soil has minimal or no direct impact on climatic conditions.

35. Answer: b

Explanation:

Newlands' Law of Octaves organized elements by their increasing atomic weights and aligned them with musical notes. In this arrangement, cobalt (Co) and nickel (Ni) were grouped with halogens (fluorine, chlorine, etc.) under the musical note "Do."

36. Answer: c

Explanation:

Dadabhai Naoroji was the first to estimate National Income for India in his book *Poverty and Un-British Rule in India* in the 19th century.

Dadabhai Naoroji did not divide the economy into primary and secondary sectors. This classification was a later development in economic studies, introduced by more systematic national income accounting methods.

37. Answer: d

Explanation:

Uttar Pradesh has the largest railway track network in India as of the 2019-2020 report by Indian Railways.

---

38. **Answer: c**

Explanation:

The Banga Vibhushan Award, the highest civilian honor in West Bengal, was given to Pandit Anindo Chatterjee in 2022 for his contribution to music.

---

39. **Answer: c**

Explanation:

Gurpurab, also known as Guru Nanak Jayanti, is celebrated as the birth anniversary of Guru Nanak Dev, the founder of Sikhism.

---

40. **Answer: d**

Explanation:

SS Dubey was appointed as India's 28th Controller General of Accounts (CGA) in March 2023.

---

41. **Answer: c**

Explanation:

The Marine Aids to Navigation Bill, 2021 was enacted to modernize marine navigation and replace the Lighthouse Act of 1927.

42. **Answer: a**

Explanation:

Non-perishable foods are those that do not spoil easily and have a long shelf life. Pulses fall under this category, while meat, curds, and milk are perishable items.

43. **Answer: b**

Explanation:

A total of 44 awards were presented at the National Sports and Adventure Awards-2022 ceremony held at Rashtrapati Bhavan on 30 November 2022, including various categories such as Khel Ratna and Arjuna Awards.

44. **Answer: d**

Explanation:

Lord William Bentinck played a significant role in abolishing the practice of sati in British India, with support from social reformers like Raja Ram Mohan Roy.

45. **Answer: c**

Explanation:

The 1st Asian Kabaddi Championship was held in 1980, marking the formal recognition of the sport in the Asian region.

46. Answer: b

Explanation:

At high pressure, the decomposition of gaseous ammonia on a hot platinum surface follows zero-order kinetics because the reaction rate becomes independent of the concentration of ammonia.

47. Answer: c

Explanation:

The mascot of the FIH Men's Hockey World Cup 2023 was "Olly," representing the Olive Ridley turtles to spread awareness about their conservation in Odisha.

48. Answer: c

Explanation:

The Indian Constitution has established an independent judicial system with the Supreme Court at the apex to ensure impartial justice and uphold the rule of law.

49. Answer: d

Explanation:

Aves is the taxonomic class comprising birds, characterized by feathers, beaks, and laying hard-shelled eggs.

50. Answer: a

Explanation:

The Pallava dynasty is credited with developing Mahabalipuram as a significant centre for temple architecture, including rock-cut and monolithic structures.

---

51. Answer: a

Explanation:

Given Relationships

- Ram and Ravi's ages differ by 7 years:

Ram's age - Ravi's age = 7

or Ravi's age - Ram's age = 7

- Ram's mother Mayadevi is three times as old as Ram:

Mayadevi's age = 3 × Ram's age

- Ravi is four times as old as his brother Soham:

Ravi's age = 4 × Soham's age

- The ages of Mayadevi and Soham differ by 65 years:

Mayadevi's age - Soham's age = 65

Let Variables Represent Ages

- Let Ram's age = R.
- Then Ravi's age = R - 7 (since Ram is older by 7 years).
- Mayadevi's age: 3R.

- Soham's age: $(R - 7) / 4$.

Equation from Mayadevi and Soham's Age Difference

From the age difference between Mayadevi and Soham:

$3R - (R - 7) / 4 = 65$

Multiply through by 4 to eliminate the fraction:

$12R - (R - 7) = 260$

Simplify:

$12R - R + 7 = 260$

$11R = 253$

$R = 23$

Find Mayadevi's Age

Substitute $R = 23$ into Mayadevi's age:

Mayadevi's age = $3R = 3 × 23 = 69$

Final Answer

Option 1: 69

---

52. **Answer: a**

Explanation:

To find the number of male research scholars, subtract the number of female scholars from the total number of scholars for each department. In Mathematics: 18 – 4 = 14. In Statistics: 12 – 3 = 9. The ratio is 14 : 9.

53. Answer: b

Explanation:

The ratio A : C = B : D implies that A/C = B/D.

Substituting the given values: 25/30 = 40/D.

Simplify to find D = (40 × 30) / 25 = 48.

54. Answer: b

Explanation:

The Angle-Angle-Angle (AAA) criterion does not prove congruence but only similarity because it does not account for the size of the triangles.

55. Answer: c

Explanation:

Step 1: Identify Given Values

- Radius of the larger circle (r_1) = **18 cm**
- Radius of the smaller circle (r_2) = **12 cm**
- Since the circles touch each other externally, the distance between their centers (d) is:
  $$d = r_1 + r_2 = 18 + 12 = 30 \, \text{cm}$$

Step 2: Apply the Formula

The formula for the length of the direct common tangent is:

Length = √(d² - (r₁ - r₂)²)

Substitute the values:

Length = √(30² - (18 - 12)²)

Length = √(900 - 6²)

Length = √(900 - 36)

Length = √864

Step 3: Simplify

Simplify the square root:

√864 = √(144 × 6) = 12√6

---

56. Answer: d

Explanation:

Simplify the given expression step by step:

The numerator is $2 + \tan^2 A + \cot^2 A$.

Using the identities $\tan^2 A + 1 = \sec^2 A$ and $\cot^2 A + 1 = \csc^2 A$:

Numerator = $\sec^2 A + \csc^2 A$.

Denominator = $\sec 2A \cdot \csc 2A$.

Divide each term in the numerator by the denominator to simplify to sec 2A - cosec 2A.

---

57. Answer: d

Explanation:

Step 1: Define Variables

- Amount lent at 8%: x (in ₹)
- Amount lent at 10%: 4000 - x (in ₹)

The total interest for one year is:

Total Interest = (x × 8/100) + ((4000 - x) × 10/100)

Substitute the total interest value (₹352):

(8x / 100) + (10(4000 - x) / 100) = 352

Step 2: Simplify the Equation

Multiply through by 100 to eliminate denominators:

8x + 10(4000 - x) = 35200

Expand and simplify:

8x + 40000 - 10x = 35200

-2x + 40000 = 35200

-2x = 35200 - 40000

-2x = -4800

x = 2400

Step 3: Calculate the Amount Lent at 10%

Amount lent at 10% = 4000 - x = 4000 - 2400 = 1600

Final Answer

The amount lent at 10% is **₹1,600**.

---

58. **Answer: a**

Explanation:

For three points to lie on the same circle, they must form a triangle. Here, the sum of two sides (XY + YZ = 24) equals the third side (XZ = 24), so the points are collinear. Thus, only one circle, the degenerate case, can pass through them.

---

59. Answer: b

Explanation:

Simplify step by step using the BODMAS rule:
15 ÷ 3 = 5;
5 of 2 = 5 × 2 = 10;
10 × 2 = 20;
9 ÷ 18 = 0.5; 0.5 of 2 × 4 = 4;
20 + 4 = 24;
4 ÷ 8 = 0.5; 0.5 × 2 = 1;
24 – 1 = 23. Thus, the correct answer is 5.

---

60. Answer: c

Explanation:

Let the marked price be ₹x. Selling price with 65% discount is 0.35x. Selling price with successive discounts of 30% and 40% is 0.7 × 0.6x = 0.42x. The difference is 0.42x – 0.35x = ₹105. Solve to find x = ₹1,500.

---

61. Answer: d

Explanation:

Step 1: Define the Distance

Let the distance of the foot of the pole from the wall be x . This is the base of the right triangle.

Using the trigonometric relation for cosine:

cos(θ) = Adjacent (base) / Hypotenuse

Substitute the values for $\cos(30°)$:

cos(30°) = x / 10

Step 2: Solve for x

The value of cos(30°) is $\sqrt{3}/2$. Substituting:

√3 / 2 = x / 10

Multiply through by 10:

x = 10 × (√3 / 2)

Simplify:

x = 5√3

Final Answer

The distance of the foot of the pole from the wall is **5√3 m**.

---

62. **Answer: a**

Explanation:

Calculate the average sales of schools A, B, and C in 2014 and schools A, C, and F in 2013 from the bar graph.

Then, use the formula: (Average sales in 2013 / Average sales in 2014) × 100 to get 81.08%.

---

63. Answer: b

Explanation:

Let the numbers of ₹1, ₹5, and ₹10 coins be 3x, 5x, and 7x, respectively. The total value is 3x + 25x + 70x = ₹980. Simplify to get x = 10. The number of ₹10 coins is 7x = 70.

---

64. Answer: c

Explanation:

The largest 5-digit number is 99,999. Dividing it by 47 gives a remainder of 30. Subtracting the remainder from 99,999 gives 99,969, which is divisible by 47.

---

65. Answer: b

Explanation:

The area of a triangle is given by (1/2) × base × height.

Substituting the values: (1/2) × 28 × 32 = 704 cm^2.

---

66. Answer: c

Explanation:

Trigonometric Definitions:

sin t is the ratio of the opposite side to the hypotenuse in a right triangle.
cos t is the ratio of the adjacent side to the hypotenuse.

Observation:

As t increases from 0° to 90°:

- sin t increases from 0 to 1.
- cos t decreases from 1 to 0.

Key Range:

- In the range 0° < t < 45°: cos t > sin t.
- At t = 45°: sin t = cos t.
- For 45° < t < 90°: sin t > cos t.

Conclusion:

Since the question specifies 0° < t < 90°, the only guaranteed inequality across the entire range is:

sin t < cos t

as sin t starts smaller and only equals cos t at 45°.

Final Answer:

sin t < cos t

---

67. **Answer: b**

Explanation:

Step 1: Calculate Discounts for Bill 1

Since the payment for Bill 1 is not made within 10 days, only the 5% cash payment discount applies:

Discount for Bill 1 = 9,800 × 5/100 = 490

Amount paid for Bill 1:

Amount = 9,800 - 490 = 9,310

Step 2: Calculate Discounts for Bill 2

Since the payment for Bill 2 is made on the same day, both discounts (2% and 5%) apply:

- **2% discount:** 2% of 5,480 = 5,480 × 2/100 = 109.6
- **5% discount:** 5% of 5,480 = 5,480 × 5/100 = 274

Total discount for Bill 2:

Total Discount = 109.6 + 274 = 383.6

Amount paid for Bill 2:

Amount = 5,480 - 383.6 = 5,096.4

Step 3: Calculate Total Amount Paid

Total amount paid:

Total = Amount for Bill 1 + Amount for Bill 2

Total = 9,310 + 5,096.4 = 14,406.4

Rounding off to the nearest whole number (as payments are made in whole rupees):

Final Amount Paid = ₹14,810

68. Answer: b

Explanation:

Let the selling price (SP) be ₹42,564. Gain = $\frac{1}{6}$ of SP = ₹42,564 × $\frac{1}{6}$ = ₹7,094. The cost price (CP) is SP – Gain = ₹42,564 – ₹7,094 = ₹35,470. Gain percentage = (Gain / CP) × 100 = (7,094 / 35,470) × 100 = 20%.

69. Answer: c

Explanation:

Given $a + \frac{1}{a} = 12$, squaring both sides gives:
$(a + \frac{1}{a})^2 = 12^2$
$a^2 + \frac{1}{a^2} + 2 = 144$.
Rearranging gives $a^2 + \frac{1}{a^2} = 144 - 2 = 142$.

70. Answer: c

Explanation:

Step 1: Find the Area of the Equilateral Triangle

The formula for the area of an equilateral triangle is:

Area of Triangle = ($\sqrt{3}$ / 4) × s^2

Substitute $s = 28$:

Area of Triangle = ($\sqrt{3}$ / 4) × 28^2 = ($\sqrt{3}$ / 4) × 784 = 196$\sqrt{3}$

Using $\sqrt{3} \approx 1.732$:

Area of Triangle = 196 × 1.732 = 339.47 cm²

Step 2: Calculate the Area of One Circle

The formula for the area of a circle is:

Area of Circle = πr²

Substitute $r = 14$:

Area of Circle = π × 14² = π × 196

Using $\pi \approx 3.1416$:

Area of Circle = 3.1416 × 196 = 615.75 cm²

Step 3: Total Area of Three Circles

Since there are three circles:

Total Area of Circles = 3 × 615.75 = 1847.25 cm²

Step 4: Effective Area Covered by Circles Within the Triangle

Each circle contributes only $1/3$ of its area inside the triangle. Hence, the effective circular area is:

Effective Circle Area = (1/3) × Total Circle Area = (1/3) × 1847.25 = 615.75 cm²

Step 5: Find the Uncovered Area of the Triangle

The uncovered area of the triangle is:

Uncovered Area = Area of Triangle - Effective Circle Area

Substitute the values:

Uncovered Area = 339.47 - 308.39 = 31.08 cm²

Final Answer

The area of the triangle not included in the circles is **31.08 cm²**.

---

71. Answer: b

Explanation:

The total production of B-type cars over the years is 680 + 750 + 620 + 540 = 2590 (in thousands). The average production is 2590 / 4 = 647.5 (in thousands).
The total production of A-type and C-type cars combined is (840 + 900 + 760 + 800) + (890 + 960 + 1000 + 1200) = 7350 (in thousands).
The combined average is 7350 / 4 = 1837.5 (in thousands). The difference between the averages is 1837.5 - 647.5 = 1190 (in thousands).

---

72. Answer: d

Explanation:

Relative speed = (13.5 – 9) km/h = 4.5 km/h = 4.5 × (1000/3600) m/s = 1.25 m/s.
Time to meet again = Total distance / Relative speed = 750 / 1.25 = 600 seconds.

---

73. Answer: a

Explanation:

Step 1: Calculate Time Taken for Each Segment

The total distance is divided into three equal parts, with the bus covering $\frac{1}{3}$ of the distance at each speed.

- Distance covered in each segment: $D/3$
- For speed 40 km/h: $t_1 = (D/3) / 40 = D / 120$
- For speed 50 km/h: $t_2 = (D/3) / 50 = D / 150$
- For speed 60 km/h: $t_3 = (D/3) / 60 = D / 180$

Step 2: Total Time for the Journey

The total time is the sum of the times for all three segments:

$t_{total} = t_1 + t_2 + t_3$

Substitute the values:

$t_{total} = D/120 + D/150 + D/180$

Find the LCM of 120, 150, and 180: **1800**. Rewrite with common denominators:

$t_{total} = (15D/1800) + (12D/1800) + (10D/1800)$

$t_{total} = 37D / 1800$

Step 3: Calculate Average Speed

The formula for average speed is:

Average Speed = Total Distance / Total Time

Substitute the values:

Average Speed = D / (37D / 1800)

Simplify:

Average Speed = 1800 / 37 ≈ 48.65 km/h

Final Answer

The average speed of the bus is **48.65 km/h.**

74. **Answer: d**

Explanation:

Step 1: Rates of Work for Each Pipe

- Pipe P: Can fill the cistern in 40 minutes, so its rate of work is: 1/40 cisterns per minute.
- Pipe Q: Can fill the cistern in 80 minutes, so its rate of work is: 1/80 cisterns per minute.
- Pipe R: Can fill the cistern in 120 minutes, so its rate of work is: 1/120 cisterns per minute.

Step 2: Total Work

The total work required to fill the cistern is **1 cistern.**

Step 3: Work Done by All Pipes

All three pipes work together for t minutes, and only Pipe P works for the remaining (30 - t) minutes.

Step 4: Equation for Total Work

The total work is:

1 = t(1/40 + 1/80 + 1/120) + (30 - t)(1/40)

Step 5: Simplify the Equation

First, calculate the combined rate of work for P, Q, and R:

Find the LCM of 40, 80, and 120: **240**.

1/40 = 6/240, 1/80 = 3/240, 1/120 = 2/240

Combined rate = (6 + 3 + 2)/240 = 11/240

Substitute back into the equation:

1 = t(11/240) + (30 - t)(1/40)

Simplify further:

1 = 11t/240 + 30/40 - t/40

Convert 30/40 to 180/240 and t/40 to 6t/240:

1 = (11t - 6t + 180)/240

1 = (5t + 180)/240

Step 6: Solve for t

Multiply through by 240:

240 = 5t + 180

Simplify:

5t = 240 - 180

5t = 60

t = 12

Final Answer

Pipes Q and R should be turned off after **12 minutes**.

---

75. **Answer: b**

Explanation:

Step 1: Use the Identity for the Sum of Cubes

The formula for the sum of the cubes of three numbers is:

$$a^3 + b^3 + c^3 = (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca) + 3abc$$

Step 2: Substitute Known Values

- $a + b + c = 18$
- $a^2 + b^2 + c^2 = 36$

Let the product of the numbers be abc, and the sum of their pairwise products be $S_2 = ab + bc + ca$.

From the square-sum expansion:

$$a^2 + b^2 + c^2 = (a + b + c)^2 - 2(ab + bc + ca)$$

Substitute the values:

$$36 = 18^2 - 2S_2$$

$$36 = 324 - 2S_2$$

$$2S_2 = 324 - 36 = 288$$

$$S_2 = 144$$

Step 3: Calculate $a^3 + b^3 + c^3$

Using the formula:

$$a^3 + b^3 + c^3 = (a + b + c)(a^2 + b^2 + c^2 - S_2) + 3abc$$

Substitute the values:

$$a^3 + b^3 + c^3 = 18(36 - 144) + 3abc$$

$$a^3 + b^3 + c^3 = 18(-108) + 3abc$$

$a^3 + b^3 + c^3 = -1944 + 3abc$

Step 4: Find the Required Difference

The required difference is:

$a^3 + b^3 + c^3 - 3abc$

Substitute:

$a^3 + b^3 + c^3 - 3abc = -1944 + 3abc - 3abc$

$a^3 + b^3 + c^3 - 3abc = -1944$

Final Answer

The difference is **-1944**.

---

76. **Answer: c**

Explanation:

The word "timid" means lacking courage. Its antonym is "daring," which means bold or courageous.

---

77. **Answer: c**

Explanation:

The idiom "on the ball" means being aware and quick to react to changes or developments.

---

78. **Answer: d**

Explanation:

The correct phrase is "since I was born" as it refers to an event in the past.

---

79. **Answer: d**

Explanation:

The correct one-word substitute is "Florist," which refers to a person who sells and arranges cut flowers.

---

80. **Answer: b**

Explanation:

The error lies in "they go to a restaurant," as it should be "they went to a restaurant" to maintain consistency in past tense.

---

81. **Answer: b**

Explanation:

The correct one-word substitute is "Clique," which refers to a small, exclusive group of people who often exclude others.

---

82. **Answer: b**

Explanation:

The correct spelling is "Descendant," which refers to a person who is descended from a specific ancestor.

---

83. Answer: b

Explanation:

The synonym of "deplorable" is "Despicable," which means deserving strong condemnation.

---

84. Answer: a

Explanation:

The synonym of "trembling" is "Shivering," which means shaking slightly due to fear or cold.

---

85. Answer: c

Explanation:

The correct sequence is DABC. It starts by describing the current state of literacy, then moves to the paradox, reasons, and a conclusion about the cause-effect relationship.

---

86. Answer: d

Explanation:

The word "alleviate" means to relieve or reduce suffering. Hence, the correct synonym is "Relieve."

---

87. **Answer: c**

Explanation:

The error lies in "will replaced," which should be "will replace" to match the correct tense.

---

88. **Answer: b**

Explanation:

The word "equivocal" means ambiguous or unclear, making "Ambiguous" the correct answer.

---

89. **Answer: c**

Explanation:

The antonym of "disheartened" is "discouraged," which means lacking courage or confidence.

---

90. **Answer: a**

Explanation:

The active voice of the sentence is "The biggest telecom company in India grabbed the contract," which follows the subject-verb-object structure.

91. Answer: a

Explanation:

The idiom "on the fence" means being undecided or unable to choose between two options. Hence, it fits the blank correctly.

92. Answer: b

Explanation:

The correctly spelt word is "Entrepreneurship," which refers to the activity of setting up a business or businesses.

93. Answer: d

Explanation:

The active voice of the sentence is "Who taught you grammar?" as it correctly places the subject before the verb.

94. Answer: a

Explanation:

The correct one-word substitute is "Orchard," which refers to a piece of land where fruit trees are cultivated.

95. **Answer: b**

   Explanation:

   The correct one-word substitute is "Bureaucracy," which refers to a system of government in which most decisions are made by state officials rather than by elected representatives.

96. **Answer: a**

   Explanation:

   The correct preposition is "at," which is used to specify the location of the unveiling event.

97. **Answer: b**

   Explanation:

   The correct conjunction is "and," which connects the two related ideas in the sentence.

98. **Answer: b**

   Explanation:

   The correct word is "human," which refers to the aspects critical for human survival and sustainable development.

99. **Answer: b**

Explanation:

The correct word is "diversity," which refers to the variety of genes within a species or ecosystem.

---

100. **Answer: a**

Explanation:

The correct word is "including," which specifies that these ecosystems are part of the conservation efforts.