1. The H.C.F. of 15,30,45,60 and 75 is

1. 15 2. 30 3. 45 4. 60

Ans: 1

Explanation

Given numbers → 15 × 1, 15 × 2, 15 × 3, 15 × 4

(∵ All the given numbers are divisible by 15). Hence, 15 is the HCF.

2. The average of even numbers from 2 to 40 is:

1. 19 2. 20 3. 21 4. 18

Ans: 3

Explanation

Given Sum = 2+4+6+…….+40

=2(1+2+3+…. +20),

Total there are 20 numbers, therefore n = 20

∴ Average= $\frac{2(1+2+3+\cdots+20)}{20} = \frac{2\times20\times21}{2\times20} = 21$

The average of first n consecutive even number is	(n + 1).
The average of first n consecutive odd numbers is	n

3. Which of the following numbers are in proportion ?

1. 7:14:: 11:22 2. 13:39::8:20 3. 5:16:: 15:48 4. 3:4:: 12:15

Ans: 1 and 3

Explanation

Multiply the first and last number and equate it to the value of multiplication of middle 2 numbers, i.e., 2nd and 3rd numbers

For option 1: 7 × 22 = 14 × 11 =154

For option 3: 5 × 48 = 16 × 15 = 240

Other options do not match.

4. $\sqrt{?}+ 9 = \sqrt{784}$

1. 631 2. 361 3. 256 4.19

Ans:4

Explanation

Given sum: $\sqrt{?}+9=\sqrt{784}$

$\sqrt{?}+9=28, \quad \therefore\sqrt{?}=19$

5. The median of the numbers 8, 5, 7, 5, 9, 9, 1, 8, 10, 5and 10 is

1. 5 2. 7 3. 8 4. 9

Ans: 3

Explanation

There are total 11 numbers.

Write the numbers in increasing order → 1,5,5,5,7,8,8,9,9,10,10.

The middle number, 6^{th} out of 11 numbers is 8. Therefore the median is 8. Examples for mean, median and mode is given below.

Mean

(Average)

Find the total of all the numbers. Then divide by the number of items

e.g., 2,2,3,5,8

2+2+3+5+8 = 20

20 ÷ 5 = 4

Mean = 4

Median

(Middle)

The middle value when numbers are in order.

e.g., 1,3,6,8,9 Median = 6

2,3,5,5,7,9 Median = 5

1,4,5,6,8,9

Median = (5+6) ÷ 2 + 55

Mode		**Range**
Mode = Most (The value which is occurring most frequently) e.g., 2,4,4,5,6 Mode = 4 3,3,3,4,6,6 Mode = 3 1,1,2,2,2,4,5 Mode = 2 4,5,7,7,8 Mode = 7		(Largest – smallest) e.g., 1,1,3,5,6 Range = 6 -1 =5 3,6,6,8 Range = 8 – 3 =5 2,3,4,4 Range = 4 -2 = 2

6. The mode of the numbers 16,15,17,12,15,15,18, 19 and 18 is

   1. 15 2. 16 3. 17 4.18

   Ans: 1

Explanation

Write the numbers in increasing order → 12, 15, 15,15,16,17,18,18,19.

15 appears the maximum number of times, i.e., 3 times. Hence 15 is the mode.

7. Sum: $6\sqrt{5} + 3\sqrt{2} - 4\sqrt{5} + \sqrt{2}$

   1. 8 2. $2\sqrt{5}+3\sqrt{2}$ 3. $2\sqrt{5}+4\sqrt{2}$ 4. $5\sqrt{7}$

   Ans:3

Explanation

Given sum: $\sqrt{5}(6-4) + \sqrt{2}(3+1) = 2\sqrt{5} + 4\sqrt{2}$

8. The H.C.F. of 4/5, 3/10, 7/15 is

   1. 1/15 2. 1/18 3. 1/30 4. 1/20

   Ans: 3

Explanation

H.C.F = $\frac{HCF\ of\ Numerator}{LCM\ of\ Denominator} = \frac{HCF\ of\ 4,3,7}{LCM\ of\ 5,10,15} = \frac{1}{30}$

9. The product of x and y is a constant. If the value of x is increased by 50%, by what percentage must the value of y be decreased?

1. 50% 2. 25% 3. $33\frac{1}{3}\%$ 4. 40%

Ans: 3

Explanation

$x_1y_1 = x_2y_2$

$$\therefore \frac{x_1}{x_2} = \frac{y_2}{y_1}$$

$$\text{Given} = \frac{x_1}{x_2} = \frac{100}{150} = \frac{y_2}{y_1}$$

$\therefore y_2 = \frac{100\, y_1}{150} = \frac{2\, y_1}{3} = 0.666y_1 = 66.66\%$ of y_1. The required reduction is 33.33%

Check: 1.5 x0.666 = 1

10. Two sides of a triangle are 6 cm and 8 cm. The length of the third side is

1.7 cm 2. 2 cm
3.greater than 2 cm and less than 14 cm 4. Above 8 cm

Ans: 3

Explanation

Properties of a triangle

In triangle, sum of 2 sides must be greater the third side or the third side shall be less than sum of the other 2 sides; also the 3rd side shall be greater than the difference between these sides'.

So, the third > 8 - 6 = 2 and also the third < 8 + 6 = 14.

So, the answer is 2 < third side < 14, i.e., the third side lies between (2 and 14).

11. Find the amount of Rs. 1000 in one year 2% per annum, when the interest is compounded half yearly.

1. 1021 2. 1020.10 3. 1020.20 4. 1021.20

Ans: 2

Explanation

Given P = Rs. 1000, R = 2% and N = 1 year

As per formula, CI = $P\left(1 + \frac{\frac{R}{2}}{100}\right)^{2n}$

$= 1000\left(1+\frac{\frac{2}{2}}{100}\right)^{2\times1} = 1000\left(\frac{10201}{10000}\right) = 1020.10$

12. Meenu's mother is four times as old as Meenu. After 5 years her mother will be 3 times as old as she will be then. What is the age of Meenu?

1. 15 2. 10 3. 20 4. 5

Ans: 2

Explanation

	Mother	Meenu
Present age	x	y
After 5 yrs	x + 5	y + 5

Given: Present ages relation is $x = 4y \rightarrow x - 4y = 0$ .....(1)

Ages relation after 5 years is $(x+5) = (y+5) \times 3 \rightarrow x - 3y = 10$ ....(2)

Eqn.(2) – Eqn.(1) gives, $y = 10$; $\therefore x = 40$ and hence $y = 10$

13. Mrs X gave some money at simple interest. At the end of the 16 years Mrs X got three times of the loan amount. Find out the rate of interest.

1. 10% 2. 12.5 % 3. 8.5 % 4. 8%

Ans: 2

Explanation

Amount after 16 years= $3P = P + SI = P + \left(\frac{PNR}{100}\right)$

i.e., $3 = 1 + \left(\frac{NR}{100}\right)$

$3 = 1 + \left(\frac{16\times R}{100}\right) = 2 = \left(\frac{16R}{100}\right)$

$\therefore R = \left(\frac{200}{16}\right) = 12.5$

14. Which of the following is the smallest fraction?

1. 1/3 2. 4/9 3. 3/5 4. 7/8

Ans: 1

Explanation

Write approximate values of the given options → 0.33, ≈0.44, 0.6, ≈0.87

15. A sells a watch to B at a gain of 10% and B sells it to C at a gain of 5%. If C pays Rs.462 what did it cost to A?

1. Rs. 250 2.Rs. 400 3. Rs. 300 4. Rs. 200

Ans: 2

Explanation

A → B → C

1 → 1.1 → 1.1 × 1.05 = 462

Therefore, Cost price = $\frac{462}{1.1\times1.05}$ = 400

16. A father had three sons. They were born at an interval of 3 years. The total age of three sons is 24 years. What is the age of the youngest son?

1. 8 years 2. 6 years 3. 11 years 4. 5 years

Ans: 4

Explanation

Let the ages of sons be x, x+3 and x+6

∴ Total of 3 sons' ages = 3x+9

Given: 3x + 9 = 24

∴ x = 5

17. 6568 ÷ 36 + 6396 ÷ 17 = ?

1. 558.6797 2. 585.7071 3. 558.5709 4. 386.9089

Ans: 1

Explanation

Given sum: $\frac{6568}{36}+\frac{6396}{17}$

= 182.4444 + 376.2353 = 558.6797

18. In the sequence 462, 420, 380, X, 306,….. X stands for

1. 352 2. 342 3. 332 4. 322

Ans: 2 (the difference between the numbers are 42, 40, 38..36)

19. Find the value of $\frac{10^{22}+10^{20}}{10^{20}}$

a) 10 b) 10^{42} c) 101 d) 10^{22}

Ans: c (Note: The given sum is $\frac{10^{22}}{10^{20}} + \frac{10^{20}}{10^{20}} = 10^2 + 1 = 101$)

20. If Rs. 1000 is invested at 12% interest and interest is compounded half yearly, what will be the total amount at the end of one `year?

1. 1120.00 2. 1123.60 3. 1126.20 4. 1134.40

Ans: 2

Explanation

Use the formula….

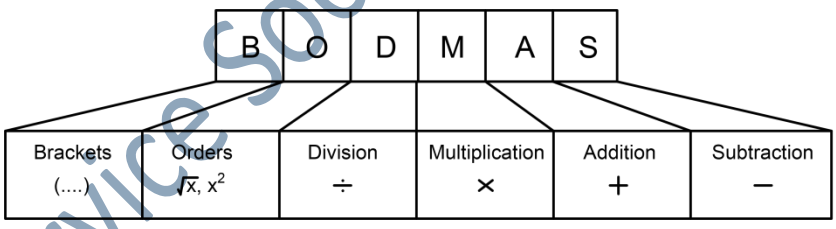
Amount, $A = P\left(1 + \frac{12}{2 \times 100}\right)^2 = 1000\left(\frac{106}{100}\right)^2 = 1123.6$

21. $5\frac{1}{4} \div 3\frac{1}{2} + 1\frac{1}{3} = ?$

1. $2\frac{5}{6}$ 2. $1\frac{5}{6}$ 3. $2\frac{1}{3}$ 4. $3\frac{1}{2}$

Ans: 1

Explanation



The given sum → $\frac{21}{4} \times \frac{2}{7} + \frac{4}{3} = \frac{3}{2} + \frac{4}{3} = \frac{9+8}{6} = 2\frac{5}{6}$ (Follow BODMAS rule)

Note: The BODMAS rule states that one should **calculate the Brackets first**, then the Orders/exponents, then any Division or Multiplication, and finally any Addition or Subtraction.

22. If $\sqrt{1936} = 44$, then the value of $\sqrt{19.36} + \sqrt{0.1936} + \sqrt{0.001936} + \sqrt{0.00001936}$ up to two places of decimals is

1. 4.86 2. 4.88 3. 4.89 4. 4.90

Ans: 3

Explanation

The given sum → 4.4 + 0.44 + 0.044 + 0.0044 = 4.8884 =4.89

23. If 2*3 = $\sqrt{13}$ and 3*4 = 5, then the value of 5*12 is

1. $\sqrt{17}$ 2.$\sqrt{29}$ 3. 12 4. 13

Ans: 4

Explanation

Given: 2*3 = $\sqrt{13}$ is of the form $\sqrt{2^2 + 3^2}$ =$\sqrt{13}$ and 3*4 is of the form $\sqrt{3^2 + 4^2}$ =$\sqrt{25}$ =5. ∴5*12 is of the form $\sqrt{5^2 + 12^2}$ =$\sqrt{165}$ = 13

24. What sum will amount to Rs.6600 simple interest in 4 years at 8% per annum?

1. Rs.6000 2. Rs.5000 3. Rs.4000 4. Rs.2000

Ans: 2

Explanation

Amount, A = P + SI = P +PNR /100

6600 = P(1 + 4x8/100)

= P(1+32/100) = P x 132/100

∴ P = $\frac{6600 \times 100}{132}$ = 5000

25. Of the three numbers, the product of two numbers taken at a time, in order are 42, 56 and 48 respectively. The L.C.M of the numbers is

1. 84 2. 168 3. 336 4. 678

Ans: 2

Explanation

Let the numbers be = x , y , z

As per given condition: xy = 42 ; yz = 56 ; xz = 48 → $\frac{x}{z}$= $\frac{42}{56}$ = $\frac{6}{8}$, $\frac{y}{x}$= $\frac{56}{48}$ = $\frac{7}{6}$

∴The numbers are = 6, 7, 8. LCM of 6, 7 and 8 (2x3, 7, 2x2x2) =2x3x7x2x2= 168)

26. Water expands $9\frac{1}{11}$ % of its volume as it freezes into ice. The cubic metres of ice which can be obtained from 55 cubic metres of water is

1. 50 2. 60 3. 80 4. 75

Ans: 2

Explanation

Method 1

Given:1 m^3 of water will result in $1 + 9\frac{1}{11}$ % m^3 of ice

= (1 + 100/1100) m^3 of ice = 1200/1100 m^3 of ice.

$\therefore$ 55 m^3 of water will result in = $\frac{1200}{1100} \times 55$ = 60 m^3

Or

Method 2

1 m^3 of water will result in =1 + $9\frac{1}{11}$% m^3 of ice.

55 m^3 of water will result in =55 + 55 x $9\frac{1}{11}$% = 55 +55 x $\frac{100}{1100}$ = 55 + 5 =60

27. The average of 10 numbers is 40. Out of those, the average of first 5 numbers is 42 and the average of last four is 35. The sixth number is

1. 35 2. 40 3. 42 4. 50

Ans:4

Explanation

Sum of numbers = average × total number of items

Let the 6^{th} number be x.

Given: 10 x 40 = 5 x 42 + 4 × 35+ x → 400 = x + 350, $\therefore$ x = 50

28. A reduction of 20% in the price of sugar enables a person to get 5.2 kg more sugar for Rs.130. The original price of sugar per kg was

1.Rs.5 2.Rs.5.75 3.Rs.6.25 4.Rs.7.50

Ans:1

Explanation

Let x = price and y = quantity that can be purchased for a certain sum of money or amount of money.

$\therefore \quad x_1y_1 = x_2y_2 \rightarrow \therefore \frac{x_1}{x_2} = \frac{y_2}{y_1}$

The amount of money to be spent is fixed. In this case the amount is Rs. 130.

As per the given condition the quantity that can be purchased is $\frac{130}{x_1} = y_1$ ……(1)

As per 20% price reduction condition the quantity that can be purchased:

$x_1 \rightarrow 0.8\, x_1$ and the quantity that can be purchased: $\frac{130}{0.8\, x_1} = y_1 + 5.2$ ……(2)

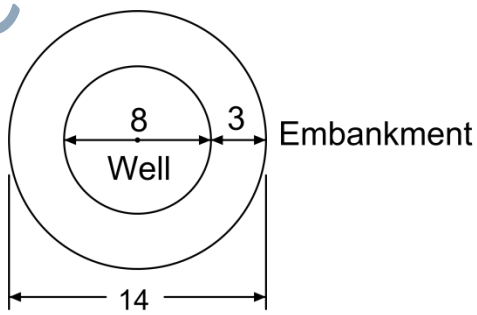
Eq.(2) ÷Eq.(1) $\rightarrow \frac{y_1+5.2}{y_1} = 0.8 \rightarrow y_1 = 26$ and $x_1 = 5$

29. A well with an inside diameter of 8m is 14 m deep. Earth taken out of it has been spread evenly all around it to a width of 3 m to form an embankment. The height of the embankment approximately is

1. 0.68 m 2. 6.8 m 3. 68 m 4. None

Ans: 2

Explanation



Given: Well diameter = 8m and Depth H = 14m (assume the well stated in the sum is a filled mass and not a cavity)

Let D_w and D_e be diameters of well and embankment respectively

h = height of earth filled to make embankment whose width is 3 m

Given: Embankment width, $D_e - D_w = 3m$

Earth volume taken out from well = $\frac{\pi}{4} D_w^2 H$

Volume of embankment after spread of earth taken from well = $\frac{\pi}{4}(D_e^2 - D_w^2) \times h$

$= \frac{\pi}{4} D_w^2 H$

$D_w = 8$; $H = 14$, $D_e = 8 + 3 \times 2 = 14$

$D_w^2 = (D_e^2 - D_w^2)\frac{h}{H}$

$8^2 = (14^2 - 8^2) \times \frac{h}{8} \rightarrow h = \frac{64 \times 8}{22x6} = 6.78m$

30. A sum of Rs.4000 yields a compound interest of Rs.630.50 in 3 years, interest being compounded annually. The rate of interest per annum is

1. 4% 2. 5% 3. 8% 4. 10%

Ans: 2

Explanation

For CI sums, formula for A= $P\left(1 + \frac{R}{100}\right)^n$ and CI = A - P

CI= $4000\left(1 + \frac{R}{100}\right)^3 - 4000 = 630.5$

$= \frac{4630.50}{4000} = \left(1 + \frac{R}{100}\right)^3$

$= \left(\frac{46305}{4000}\right)^{1/3} = 1 + \frac{R}{100}$

$= \left(\frac{9261}{800}\right)^{1/3} = 1 + \frac{R}{100}$

$= \left(\frac{9261}{800}\right) = 1 + \frac{R}{100}$

$= \frac{21}{20} = \left(1 + \frac{R}{100}\right)$

$= \frac{21}{20} - 1 = \frac{R}{100}$

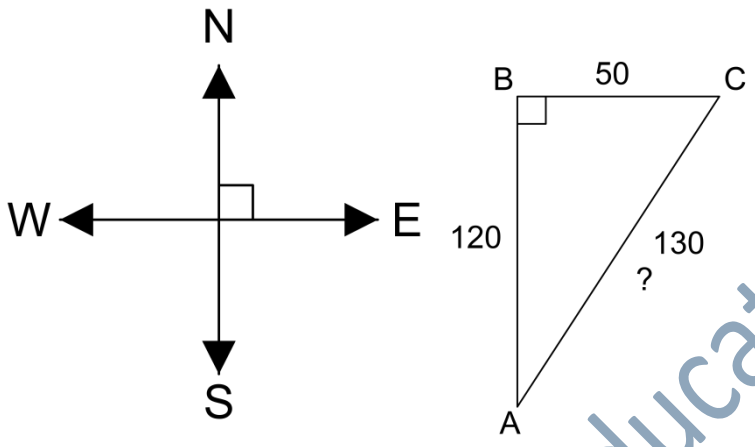
$= \frac{R}{100} = \frac{1}{20}$. $\therefore R = 5\%$

31. A postman walks towards North a distance of 120 m to deliver a letter. He then goes towards East for a distance of 50 m for delivering another letter. The shortest distance between the two places is

1. 70 m 2. 120 m 3. 130 m 4. 170 m

Ans: 3

Explanation



(Pythagorian Triples)

32. A certain sum of money at simple interest amounts to Rs.1012 in 2½ years and to Rs.1067.20 in 4 years. The rate of interest per annum is

1. 2.5% 2. 3.0% 3. 4.0% 4. 5.0%

Ans: 3

Explanation

For SI, amount, $A = P + \frac{PNR}{100} = P\left(1 + \frac{NR}{100}\right)$

Given SI accrued in 2½ years: $1012 = P\left(1 + \frac{2.5 \times R}{100}\right)$ …….(1)

Given SI accrued in 4 years $1067.2 = P\left(1 + \frac{4 \times R}{100}\right)$ ……(2)

Divide Eqn.(2) by Eqn.(1)

$\frac{1067.}{1012} = \frac{100+4R}{100+2.5R} \rightarrow$ 101200 + 4048 R = 106720 + 2668R

i.e., 1380R = 5520

∴ R = 4

33. If the diagonals of quadrilateral bisect each other at right angles, the quadrilateral is called a

1. rhombus, square 2. parallelogram 3. Deltoid 4. Rectangle

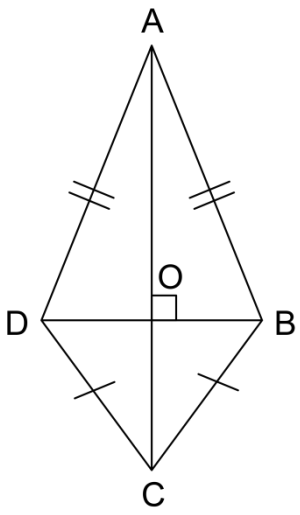
Ans: 1 and 3.

Explanation

1.Diagonals bisects each other in respect of Square, Rectangle, Rhombus, Parallelogram and Kite.

2.Diagonals bisects each other at right angle in respect of Square, Rhombus and Kite.

Kites (Deltoids)



A kite, also called a deltoid, is a quadrilateral in which there are two pairs of adjacent edges that are equal.The diagonals of a kite are perpendicular to each other.

34. An electric train runs from a station A to a station B at a speed of 60 kmph and immediately runs from B to A at a speed of 40 kmph. The average speed of the train, in kmph, is

1. 60 2. 50 3. 48 4. 46

Ans: 3

Explanation

Average speed = $\frac{2V_1V_2}{V_1+V_2} = \frac{2\ x\ 60\ x\ 40}{60+40}$ = 4800/100 =48

35. The cost of a table and a chair is Rs.80/-. If the cost of the table increased by 50%, the total cost of the table and the chair became Rs.90/-. What is the cost of the chair ?

1. Rs.35 2. Rs.42 3. Rs.55 4. Rs.60

Ans:4.

Explanation

Let the table cost be x and chair y.

x+ y = 80 --------- (1)

1.5x + y = 90 -------(2)

Eqn.(2) – Eqn.(1). → x = 20 and y = 60

36. A sum of money at simple interest becomes three times in 10 years. The rate of interest is

1. 10% 2. 15% 3. 20% 4. 30%

Ans: 3

Given: P + SI = 3P in 10 years ∴SI = 2P. $\frac{PNR}{100} = 2P \ \therefore R = \frac{2}{10} \times 100 = 20\%$

37. The average age of an adult class is 40 years. 12 new students with an average age of 32 years join the class, thereby decreasing the average of the class by 4 years. The original strength of the class was

1. 10 2. 11 3. 12 4. 15

Ans:3

Explanation

Let the original strength of class be x. Later 12 students join and the average of the class of x+12 students is 36.

The given conditions:

Sum of ages of original strength + sum of ages of 12 new students of average age 32 = Total age of (x + 12) students

i.e., 40x + 12 × 32 = (x + 12) × 36 → 40x – 36x = 12 × 36 – 12x 32 → x =12

38. In a bag there are coins of 25 paise and 10 paise in the ratio 6:17. If the bag contains Rs.16, then the number of 10 paise coins is

1. 30 2. 40 3. 70 4. 85

Ans: 4

Explanation

Let the ratio of coins be 6x:17 x

∴Total amount: 6x × 25 + 17x × 10 = 1600 (Rs. 16 → 1600 *paise*)

150x + 170x = 1600, 320x = 1600, x = 5

∴Number of 10 paise coins is 17x = 85

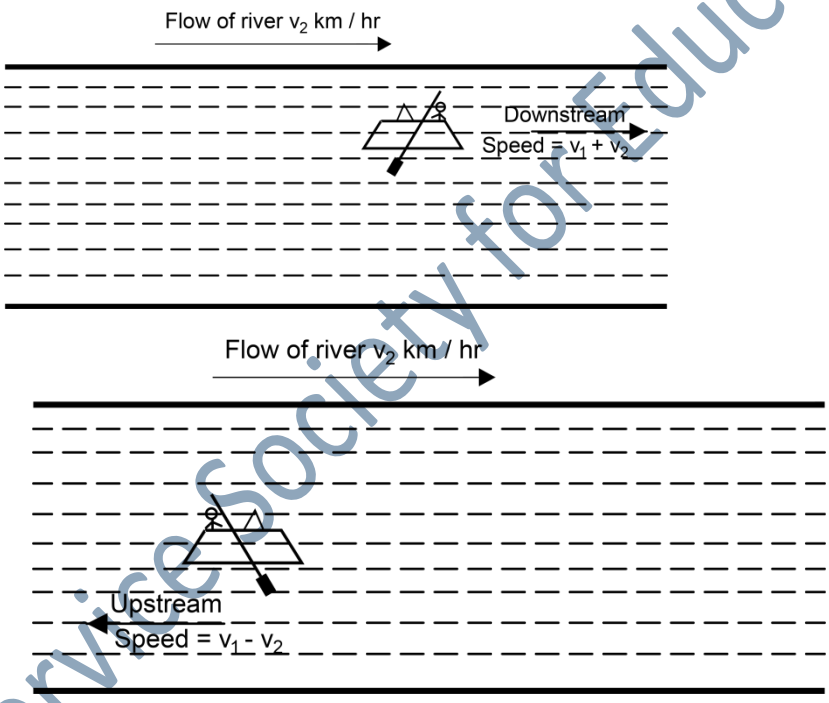
39. A man can swim 3 kmph in still water. How many hours will he take to swim to a place 6 km upstream and back if the velocity of the stream is 2 kmph ?

1. 6 2. 4 1/5 3. $7\frac{1}{5}$ 4. 7

Ans: 3

Explanation

Let V_1 be man's swimming speed in still water



Let the speed of man in still water, x =3 kmph.

Speed of the stream, y = 2 kmph.

Upstream speed of man = x−y = 1 kmph.

Downstream speed of man = x+y = 5 km/hr.

Time to reach upstream destination, $t_1 = \frac{\text{Distance}}{\text{Upstream speed}} = \frac{6\text{km}}{1\text{ km/hr}} = 6\text{hr}$

Time to reach original destination, $t_2 = \frac{\text{Distance}}{\text{downstream speed}} = \frac{6\text{km}}{5\text{ km/hr}} = 1\frac{1}{5}\text{hrs}$

Total time= time for upstream travel + time for downstream travel = 6 hr +1 $\frac{1}{5}$hr = 7$\frac{1}{5}$hr

40. The hands of a clock are 3 cm and 1 cm long respectively. The difference between the distances traversed by their extremities in 6 hours is

1. 9π cm 2. 18π cm 3. 24π cm 4. 35π cm

Ans: 4

Explanation

In a clock,

The seconds' hand complete one revolution in one minute

The minute hand complete one revolution in one hour

The hour hand complete one revolution in 12 hour

The difference between the distances traversed by their extremities in 6 hours =

Number of rounds completed by the minute hand in 6 hours and hence distance travelled-

Number of round(s) completed by the hour hand in 6 hour and hence the distance travelled

$= [6\,x(2 \times \pi \times 3) - 6/12(2 \times \pi \times 1)]$

$= 36\pi - \pi = 35\pi$ cm

41. If Rs.1066 are divided among A, B, C and D such that A:B = 3:4, B:C = 5:6 and C:D = 7:5, who will get the maximum ?

1. B 2. A 3. C 4. D

Ans:3

Explanation

Method 1 : Logical method

A:B=3:4 means B is getting more than A

B:C=5:6 means C is getting more than B. This means C is getting more than both A and B.

C: D=7:5 means C is getting more than D. This means C is getting more than B, C and D

Method :2 – Arithmetic way

As per the given statements, B = $\frac{4A}{3}$, C = $\frac{6B}{5}$, D = $\frac{5C}{7}$

Convert the fractions of C and D in terms of A → C = $\frac{6}{5}x\frac{4A}{3} = \frac{8}{5}A$ and

D = $\frac{5}{7} x \frac{6}{5} x \frac{4A}{3} = \frac{8A}{7}$

∴A:B:C:D = A : $\frac{4A}{3}$: $\frac{8A}{5}$: $\frac{8A}{7}$

= A : 1.33A : 1.6 A : 1.14A = A(1 : 1.331 : 1.6 : 1.14)

∴ C gets maximum

42. Gold is 19 times as heavy as water and copper is 9 times as heavy as water. In what ratio these be mixed to get an alloy 15 times as heavy as water, i.e., glold:copper?

1. 1:1 2. 2:3 3. 1:2 4. 3:2

Ans: 4

Explanation

Density ratio	**Density ratio**
Gold : water	copper: water
19 : 1	9:1

Let 1 gm gold be mixed with x gm copper and the resulting mass
=19 × 1 + 9x = (x + 1)x15
= 6x = 4
∴ x = 2/3
Ratio mixed = 1 : x = 1: 2/3 = 3:2, i.e., 3 parts gold and 2 parts copper.

43. The area of a circular path of uniform width x surrounding a circular region of radius r is

1. $2\pi r+\pi x^2$ 2. $2\pi rx+\pi x$ 3. $2\pi rx+\pi x^2$ 4. $\pi rx+\pi x^2$

Ans: 3

Explanation

$\pi(r + x)^2 - \pi r^2 = 2\pi rx+\pi x^2$

44. A and B run round a circular garden whose circumference is 1200 m at the rate of 210 m and 190 m per minute respectively. If they run in opposite directions, they will meet each other in

1. 2 minute 2. 3 minute 3. 3.5 minute 4. 4 minute

Ans: 2

Explanation

Stretch the circular orbit as a straight line given below:

1200 m

A: 210 m/min → ← B: 190 m/min

Assume that A and B meet after time t minutes.

During the time t, the sum of the distance travelled by A and B is 1200m.

i.e., $t \times 210 + t \times 190 = 1200$

$\therefore t = 3$

45. In an examination, 52% and 40% candidates respectively failed in Science and Maths. If 27% candidates failed in both the subjects, then the percentage of candidates passing the examination is

1. 35 2. 48 3. 60 4. 65

Ans: 1

Explanation

The given information all pertains to failed students only.

$\therefore$ Use the formula: $n(A \cup B) = n(A) + n(B) - n(A \cap B)$

Total failed students = 52 + 40 – 27 = 65

$\therefore$ Number of passed students = Total students – Number of failed students

=100-65 = 35

46. The length of the wire of 0.2 mm radius that can be drawn after melting a solid copper sphere of diameter 18 cm is

1. 24.3 m 2. 243 m 3. 2,430 m 4. 24,300 m

Ans: 4

Explanation

Use all dimensions in mm.

Given: Sphere dia = 18 cm and therefore radius R =90mm and wire radius

Let L be the length of wire drawnand radius be r.

$Volume\ of\ sphere = Volume\ of\ wire\ drawn$

$\frac{4}{3}\pi R^3 = \pi r^2 L$

$\frac{4}{3}\pi x 90^3 = \pi x 0.2^2 L$

$L = \frac{4}{3} x 90^3 x \frac{1}{0.2^2}$

L =24300000 mm= 24,300 m

47. If A:B = 3:4, B:C = 5:6 and C:D = 2:3, then A:D equals

1. 2:3 2. 5:9 3. 5:12 4. 7:12

Ans: 3

Explanation

$\frac{A}{D} = \frac{A}{B} x \frac{B}{C} x \frac{C}{D} = \frac{3}{4} \times \frac{5}{6} \times \frac{2}{3} = \frac{5}{12}$

48. A horse worth Rs.9000 is sold by A to B at a 10% loss. B sells the horse back to A at a 10% gain. The result is

1. A makes no profit and loss
2. B gains Rs.900
3. A losses Rs.900
4. A losses Rs.810

Ans: 4

Explanation

A to B selling price = $\frac{90}{100} \times 9000 = 8100$

B to A selling price = $\frac{110}{100} \times 8100 = 8910$.

A buys at a higher price than he sold to B. Therefore loss to A = 8910-8100 = 810.

Gain to B =8910-8100 = 810.

49. A can do a piece of work in 7 days of 9 hours each, and B can do it in 6 days of 7 hours each. How long will they take to do it, working together $8\frac{2}{5}$ hours a day ?

1. 2 days 2. 3 days 3. 4 days 4. 4½ days

Ans: 2

Explanation

	Hrs/day	No. of days	Total hr
A	9	7	63
B	7	6	42

Combined work in 1 hour = $\frac{1}{42} + \frac{1}{63} = \frac{63+42}{63 \times 42}$

∴ Time taken to complete the work = $\frac{63x42}{63+42}$ =25.2 hr

$8\frac{2}{5}$ hr per day = $\frac{25.2}{8\frac{2}{5}}$ = 3

50. Two trains travel in opposite directions at 36 km and 45 km per hour and a man sitting in the slower train passes the faster train in 8 seconds. The length of the faster train is

1. 80 m 2. 100 m 3. 120 m 4. 180 m

Ans: 4

Explanation

As the trains travel in opposite direction, the relative speed:

(45+36) km/hr=(81×5/18) m/sec=(405/18) m/sec

∴ Length of the faster train= time x speed = 8x405/18=180m