1. Which of the following is equal to 1?

1) $2^0 + 3^0 + 4^0$ 2) $2^0 \times 3^0 \times 4^0$

3) $(3^0 - 2^0) \times 4^0$ 4) $(3^0 - 2^0) \times (3^0 + 2^0)$

Ans: 2.

Explanation
Option a. → 1 + 1 +1 = 3
b. →1 × 1 × 1 = 1
c. → 0 × 1 = 0
d. → 0 × 2 = 0

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

1. $\frac{1}{4\frac{19}{60}}$ 2. $\frac{1}{2\frac{1}{7}}$ 3. $2\frac{1}{7}$ 4. $\frac{5}{7}$

Ans: 3

Explanation

Ans: Given sum → $\frac{4}{7} + \frac{5}{7} + \frac{6}{7} = \frac{15}{7} = 2\frac{1}{7}$

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

1. $2\frac{3}{8}$ 2. $8\frac{2}{3}$ 3. $12\frac{3}{16}$ 4. None

Ans: 1

Explanation

Given sum → $2 + \frac{3}{4+\frac{5\times4}{5}} = 2 + \frac{3}{4+4} = 2\frac{3}{8}$

4. $\frac{1}{\sqrt{3}} + \frac{1}{2\sqrt{3}} + \frac{1}{3\sqrt{3}} = ?$

1. $\frac{11}{6\sqrt{3}}$ 2. $\frac{6\sqrt{3}}{11}$ 3. $\frac{2\sqrt{3}}{11}$ 4. $\frac{3\sqrt{3}}{11}$.

Ans: 1

Explanation

Denominators of the given fractions are $\sqrt{3}$, $2\sqrt{3}$ and $3\sqrt{3}$; their LCM is $\sqrt{3} \times 2 \times 3 = 6\sqrt{3}$)

Given sum → $\frac{1}{\sqrt{3}} + \frac{1}{2\sqrt{3}} + \frac{1}{3\sqrt{3}} = \frac{6+3+2}{6\sqrt{3}} = \frac{11}{6\sqrt{3}}$

5. Which of the following numbers should be subtracted to 11065 to make it exactly divisible by 79?

1. 11 2. 9 3. 5 4. 7

Ans:3

Explanation

Dividend = 11065

Divisor = 79

Number should be subtracted to 11065:

11065 ÷79. The remainder is to be subtracted from dividend to get exactly to be divided

Here quotient is 140 and remainder is 5. Hence 5 is to be subtracted.

6. The H.C.F of 13.6 and 1.7 is

1.0.87 2. 0.17 3. 1.7 4. 1.8

Ans: 3

Explanation

Multiply 13.6 and 1.7 by 10 → 136 , 17 → 8x17, 1x17;

∴ HCF of 136 and 17 is 17 → HCF of 13.6 and 1.7 is $\frac{17}{10}$= 1.7

7. The H.C.F of two numbers is 10 and their L.C.M is 10,350. If one of these numbers is 230, find the other number.

1. 287 2. 283 3. 450 4 328

Ans: 3

Explanation

For sums of the given pattern, i,e,, the formula relating LCM, HCF and the 2 numbers:

HCF x LCM = Product of the two numbers

∴ The other number = $\frac{10 \times 10350}{230}$ = 450

8. Find the smallest fraction number among the following fractions: $\frac{3}{2}, \frac{5}{8}, \frac{6}{5}, \frac{8}{7}$

1. $\frac{3}{2}$ 2. $\frac{6}{5}$ 3. $\frac{5}{8}$ 4. $\frac{8}{7}$

Ans: 3

Explanation

The decimal form of the given fractions $\frac{3}{2}, \frac{5}{8}, \frac{6}{5}, \frac{8}{7} \rightarrow$ 1.5, 0.625, 1.2, ≈1.14.

From these numbers, the smallest fraction is $\frac{5}{8}$ = 0.625.

10. $3\frac{1}{8}$% of 128 = ?

1. 32 2. 25 3. 4 4. 50

Ans: 3

Explanation

The given sum → $\frac{25}{8} \times \frac{1}{100} \times 128 = \frac{400}{100} = 4$

11. The perimeter of a triangle is 100 m and its sides area in the ratio 1:2:2. The area of triangle (inm^2) is

1. $100\sqrt{3}$ 2. $100\sqrt{15}$ 3. $100\sqrt{5}$ 4. $100\sqrt{7}$

Ans: 2

Explanation

Let the sides of the triangle be x, 2x, 2x

Perimeter, P =100 = 5x. ∴x= 20 → The sides are 20,40 and 40.

Use Heron's formula to find the area:

$s = \frac{a+b+c}{2} = 50$

Area, $A = \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{50 \times 30 \times 10 \times 10} = \sqrt{150000} = 100\sqrt{15}$

9. The sum of all the interior angles of a pentagon is

1. 360° 2. 450° 3. 540° 4. None

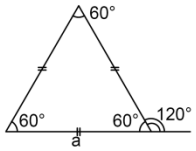
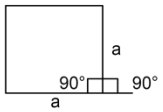
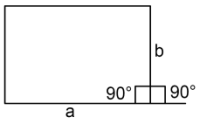
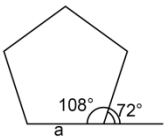
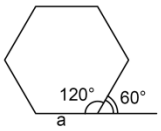
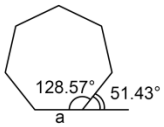
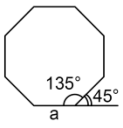
Ans:3

Explanation

5 x 108° =540°.

Note: Sum of interior and exterior angles for few polygons are shown below:

Table 2 - Sum of interior / exterior angles of few regular polygons.

Shapes	No. of Sides, n	*Each interior angle = Sum of interior angles / No. of sides, n	Sum of interior angles	Sum of exterior angles (=360° for all polygons.)	Illustration
1. Equilateral triangle	3	60°	3 x 60° = 180°	3 x 120° = 360°	
2. Square	4	90°	4 x 90° = 360°	4 x 90° = 360°	
3. Rectangle	4	90°	4 x 90° = 360°	4 x 90° = 360°	
4. Regular pentagon	5	108°	5 x 108° = 540°	5 x 72° = 360°	
5. Regular hexagon	6	120°	6 x 120° = 720°	6 x 60° = 360°	
6. Regular heptagon	7	128.57°	7 x 128.57° = 900°	7 x 51.43° = 360°	
7. Regular octagon	8	135°	8 x 135° = 1080°	8 x 45° = 360°	

* Each Interior angle = $\left(180° - \frac{360°}{n}\right) = \frac{(n-2) \times 180°}{n}$

12. The difference between two numbers is 9 and their sum is 19. What will be their product?

1. 70 2. 187 3. 151 4. 176

Ans: 1

Explanation

Let the numbers be x, y.

It is given that x – y = 9 and x + y = 19 → x =14; y = 5; ∴xy = 70.

13. $\frac{15.72X15.72-5.72X5.72}{15.72+5.72}$

1. 5 2. 10 3. 15 4. 25

Ans: 2

Explanation

The given sum is of the form: $\frac{a^2-b^2}{a+b}$ = a – b where a= 15.72 and b = 5.72.

∴ $a - b$ =15.72 – 5.72 = 10

14. $\sqrt{?} + \sqrt{625}$ = 40

1. 225 2. 125 3.196 4. 169

Ans: 1

Explanation

Ans: Assume the unknown number as x.

$\sqrt{x}$ + 25 = 40

$\sqrt{x}$= 15 ∴ x = 225

15. By selling a vehicle for Rs.25,800, Mani makes a profit of 20%, his gain in terms of rupees is

1. Rs.4,300 2.Rs.3,800 3. Rs.4,650 4. Rs.3,600

Ans: 1

Explanation

Assume CP =100 and SP =120 and hence profit = 20.

Profit for SP of Rs. 25800

$\therefore \frac{20}{120} \times 25800 = 4300$

16. "A" can do a piece of work in 25 days and "B" can finish the same work in 20 days. They work together for 5 days and then A goes away. In how many days B will finish the balance work?

1. 10 days 2. 11 days 3. 20 days 4. 33 1/3 days

Ans: 2

Explanation

A's one day work part $=\frac{1}{25}$ and for B $=\frac{1}{20}$

A and B's one day work part $=\frac{1}{25}+\frac{1}{20}=\frac{4+5}{100}=\frac{9}{100}$

Work done by A and B together in 5days $=\frac{9}{100}\times 5=\frac{45}{100}$

∴After 5 days of joint working, the balance work to be completed $=\frac{55}{100}$

∴No. of days to complete the balance work, by B $=55/100\div 1/20$

$= 55 \times 20/100 = 11$ days

17. A 150 meter long train crosses a tree in 5 seconds. What is the speed of the train in kilometer per hour?

1. 80 kmph 2. 108 kmph 3. 100 kmph 4. 120 kmph

Ans:2

Explanation

Assume the tree as a point object, i.e., there is no length to cross by the train.

Speed = distance/time $=\frac{150}{5}=30\ m/s=30\times\frac{18}{5}$ kmph = 108 kmph

18. The breadth of a rectangular hall is two-third of its length. If the area of the hall is $54m^2$, what is the difference between the length and breadth of the hall in metre ?

1. 3 2. 6 3. 5 4. 2

Ans: 1

Explanation

Le the sides of rectangle be ℓ and, $\frac{2}{3}\ell$. ∴ Area, $A=\frac{2}{3}\times\ell^2=54\rightarrow\ell^2=81$ ∴ $\ell=9$ and $b=6$.

19. The average of first 6 prime number is

1. $6\frac{5}{6}$ 2. 7 1/3 3. 6 1/8 4. none of these

Ans: 1

Explanation

First six prime numbers are 2, 3, 5, 7, 11 and 13.

Average $= \frac{total\ of\ 6\ prime\ numbers}{6} = \frac{41}{6} = 6\frac{5}{6}$

20. If 98% of students are present in a class and 8 students are absent, the total number of Students in the class is

1. 250 2.400 3. 420 4. 375

Ans: 2

Explanation
Given: Absent = 2% which is equal to 8
2% →8 ∴ Total students $= \frac{8}{2} \times 100 = 400$

21. The ratio of the mother's age to son's age is 5:1. The product of their ages is 405. The ratio of their ages after 5 years will be

1. 25:7 2. 7:36 3. 7:24 4.none of

Ans: 1

Explanation
Let the present ages of mother and son be 5x and x respectively.
Their ages after 5 years: (5x+5) and (x+5)
It is given that: 5x * x = 405→$5x^2$ = 405 ∴ x^2 = 81 → x = 9
∴ Age after 5 years = (5×9 +5) :(9+5)
= 50 :14
= 25:7

22. A cart runs at the rate of 6 km per hour for the first 20 km distance and at 12 km per hour for the second 20 km distance. The average speed of the cart in kilometer is

1. 6.0 km/hr 2. 5.0 km/hr 3. 6.5 km/hr 4. 8 km/hr

Ans: 4

Explanation

Distance for each spell of travel is 20km and hence the total distance is 40km.

The speeds are 6 kmph (V_1) and 12 kmph (V_2).

Since the distance travelled is same in both the spells/trips, $V_{avg} = \frac{2v_1v_2}{v_1+v_2}$

$= \frac{2\times6\times12}{6+12} = \frac{144}{18} = 8$

Or

Time taken for the first 20km, t_1 = 20/6 hr = $3\frac{1}{3}$ hr

Time taken for the second 20km, t_2 = 20/12 hr = $1\frac{2}{3}$ hr

For the journey, total time taken = $3\frac{1}{3} + 1\frac{2}{3}$ = 5 hr

The total distance = 20+20 =40 km.

∴ Average speed = 40/5 = 8 kmph. (Note. If the sum is understood properly, in competitive examinations, mostly the first method may take less time to solve the sum)

23. A particular sum was invested at 5% compound interest for two years and at the end of the period it amounted to Rs.441. What was the amount invested?

1. Rs.380 2. Rs.400 3. Rs.350 4.Rs.375

Ans: 2

Explantion

For CI: A =P $\left(1+\frac{5}{100}\right)^2$ = 441

P × $\frac{21^2}{20^2}$ = 441 ∴ P = 400.

24. How many bricks of 20 cm x 10 cm will be needed to make the floor of a room 25m in length and 16m wide? If the price of such bricks is Rs.3.10 per hundred bricks, find also the cost

1. 15000 bricks Rs.500 2. 25000 bricks Rs.600
3. 20000 bricks Rs.620 4. 10000 bricks Rs.650

Ans: 3

Explanation

i) No .of bricks = $\frac{\text{Area of floor}}{\text{Area covered by one brick}}$

= $\frac{2500 \times 1600}{20 \times 10}$ = 20000

ii) Cost of bricks @ of Rs. 3.10 per brick = $\frac{20000 \times 3.10}{100}$ = 620

25. By selling a vehicle for Rs.23,800, Kumar makes a profit of 19%. His gain in terms of rupee is

1. Rs.3,800 2.Rs.2,800 3.Rs.4,250 4.Rs.3600

Ans: 1

Explanation

If CP is Rs. 100, SP = 119 and profit =Rs 19.

Ans.: Profit = $23800 \times \frac{19}{119} = 3800$

26. The breadth of a rectangular hall is three-fifth its length. If the area of the hall is 135 square metre, what is the difference between the length and breadth of the hall in metres?

1. 3 2. 6 3. 9 4. 15

Ans: 2

Explanation

Let the length be ℓ and breath b.

Given $b = \frac{3}{5}\ell$

$\therefore$Area, $A = \ell b = \ell \times \frac{3}{5}\ell = \frac{3\ell^2}{5} = 135 \ \therefore \ell = 15 \rightarrow \ b = 9,$

Difference between l and b = 6.

27. The difference between two numbers is 14 and their sum is 20. What will be their product?

1. 51 2. 47 3. 56 4. 46

Ans: 1

Explanation

Let the numbers be x, y.

Given: x – y = 14 …….(1)

x + y =20 …….(2)

$\therefore$ Eqn. (1) + Eqn. (2) $\rightarrow$ 2x = 34 $\rightarrow$ x = 17. $\therefore$ y = 3 and their product, xy= 51

28. Ravi's age is 2/3rd of Meena's. After 5 years Ravi will be 45 years old. Meena's present age is……..

1. 55 2. 56 3. 58 4. 60

Ans: 4

Explanation

Let Meena's age be x. Now, Ravi's age is $\frac{2}{3}$ x and after 5yrs $\frac{2}{3}$ x + 5 = 45

(as per the given condition)

$\therefore \frac{2x}{3} = 40 \rightarrow x = 60$

29. If the average of 40 numbers is 60, then the sum of the numbers is

1. 5 2. 200 3. 100 4. 2400

Ans: 4

Explanation

Total = Average × number of items

Total or sum of numbers = 40× 60 = 2400

30. If 3x = 8y and 5y = 9z then x/z = ?

1. $\frac{24}{5}$ 2. 83/15 3. 9/8 4. 11/83

Ans: 1

Explanation

From given data, $x = \frac{8y}{3}$, $z = \frac{5y}{9}$,

$\therefore \frac{x}{z} = \frac{\frac{8y}{3}}{\frac{5y}{9}} = \frac{8}{3} \times \frac{4}{5} = \frac{24}{5}$

31. From his income, a proprietor invests 65% in machinery, 20% in raw material and still has Rs. 1,305 cash with him, Find his total investment.

1. Rs.7,500 2. Rs.7,225 3.Rs.8700 4.Rs.1,300

Ans: 3

Explanation

Balance after investment = 1-0.65 – 0.20 = 0.15, which is equal to Rs. 1305.

∴ Total investment = $\frac{1305}{0.15} = \frac{1305 \times 100}{15} = 8700$

32. What percent of 340 kg is 119 Kg?

1. 28 % 2. 38.75 % 3. 35 % 4. 45 %

Ans:3

Explanation

$\frac{x}{100} \times 340 = 119, \therefore x = \frac{119}{340} \times 100 = 35$

33. What is 30% of 40% of 260?

1. 26.2 2. 31.2 3. 28.2 4. 43.2

Ans: 2

Explanation

Ans: $\frac{30}{100} \times \frac{40}{100} \times 260 = \frac{30}{100} \times \frac{40}{100} \times 260 = 12 \times 2.6 = 31.2$

34. If x: y = 2:3 and 2:x = 1:2, then the value of y is

1. 1/3 2. 3/2 3. 6 4. 4

Ans: 3

Explanation:

From the given data, 3x = 2y and x = 4; ∴y=6

35. 70.009 - 19.07007 =?

1. 50.59993 2. 50.99902 3. 60.99993 4. 50.93893

Ans: 4

36. If (45% of 180) = $\sqrt{x}$, find x.

1. 3 2.8 3. 7 4. 9

Ans:4

Explanation

Given: $\frac{45}{100} \times 180 = \sqrt{x} \rightarrow \frac{9}{20} \times 180 = 81 = \sqrt{x}$, i.e., $\therefore \sqrt{x} = 81 \therefore x = 9$

37. 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 are 15× 1, 15 × 2, 15× 3, 15 × 4, 15× 5

∴ HCF =15

38. The L.C.M. of 4, 8, 12 and 16 is

1. 8 2. 12 3. 16 4. 48

Ans: 4

Explanation
Given numbers are 1×4, 2×4 , 3×4 , 4×4
∴ LCM = 3×4×4
= 48 (Note: 48 is divisible by 8, 12, 16 and 48)

39. Which of the following numbers is prime? 15, 16, 17, 18 and 20

1. 17 2. 18 3. 15 4. 16

Ans: 1

40. The angle which exceeds its complement by 20^o is

1. 30^o 2. 55^o 3. 60^o 4. 45^o

Ans: 2

Explantion

Let the number be x and its complement = 90-x

Given x-(90-x) = 20

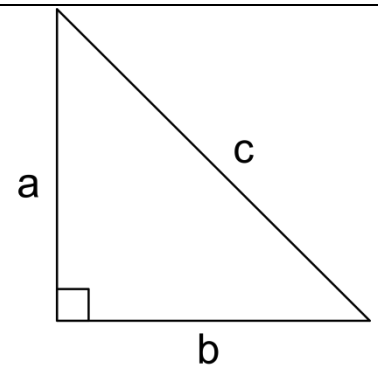
∴ 2x = 110 → x = 55°

41. In a right-angles triangle, the square of the hypotenuse is twice the product of the other 2 sides. The triangle is

1. An equilateral 2. Isosceles right angled triangle of angles 45^o, 45^o, 90^o
3. With angles 30^o, 60^o, 90^o d. None of these

Ans :2

Explanation



For the above triangle, $c^2 = a^2 + b^2$

It is given that $c^2 = 2ab$

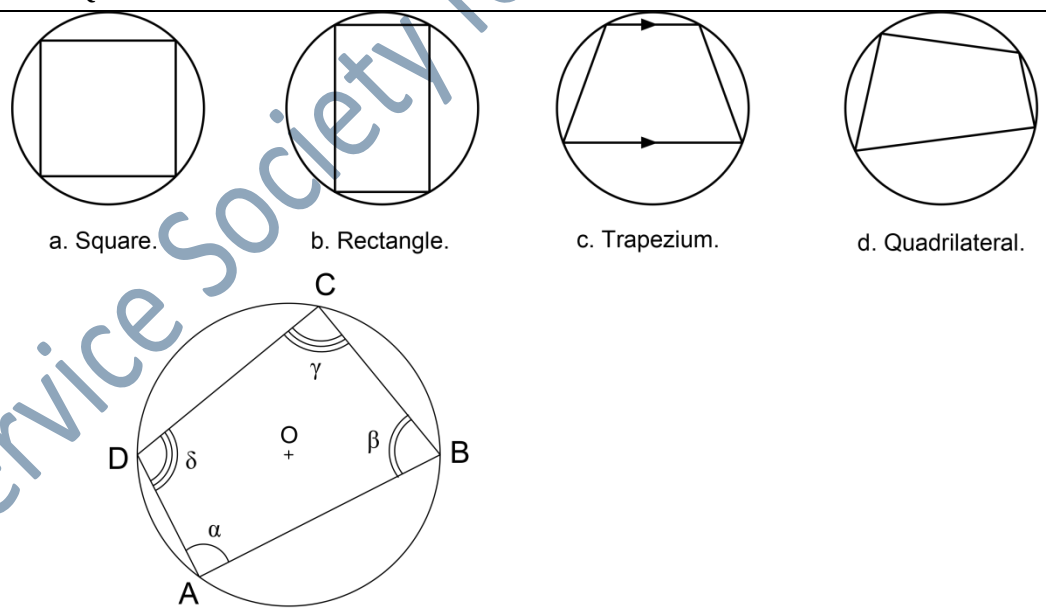
$\therefore 2ab = a^2 + b^2$ · This condition is true/met for a =b only.

42. Opposite angles of cyclic quadrilaterals (CQ) are

1. supplementary
2. complementary
3. equal
4.. No definite relation exists

Ans: 1. (∵ their sum is 180°); it is one of the features of a cyclic quadrilateral.

Box: CQ



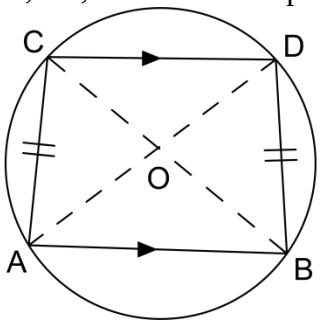
$\alpha + \gamma = \beta + \delta = 180°$

43. A pair of opposite sides of a cyclic quadrilateral are equal. Which is true?

1. Its diagonal are equal
2. It is rhombus
3. It is a parallelogram
4. No definite relation exists

Ans: 1

Explanation: It can be a trapezium. No rhombus or parallelogram can be laid/drawn in a circle, i.e., rhombus and parallelogram are not cyclic quadrilateral.

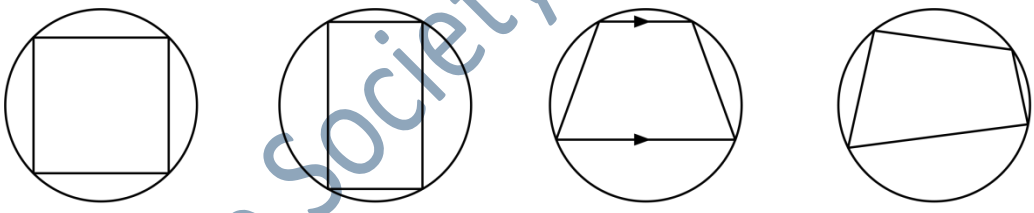


44. Any cyclic parallelogram is a

1. rhombus
2. trapezium
3. rectangle
4. Deltoid

Ans: 3

Explanation



Note: No rhombus or parallelogram can be drawn inside a circle.

45. If $2^{2x-y} = 16$ and $2^{x+y} = 32$ the value xy is

1. 1
2. 4
3. 6
4. None

Ans:3

Explantion

Given: $2^{2x-y} = 2^4$ and $2^{x+y} = 2^5$

∴ 2x-y = 4 and x +y = 5

∴3x = 9

x = 3 and y=2

∴ xy =6

46. In a group of 500 people, 200 can speak Tamiz only while only 125 can speak English only. The number of people who can speak both Tamiz and English are

1.175 2. 325 3. 300 4. 375

Ans : 1

Explanation

$A \cup B = \in A + \in B - A \cap B$

$500=200+125 - A \cap B$

$\therefore A \cap B = 175$

47. A wire of length 25 cm is bent so as to lie along the arc of a circle of circumference 100 cm. The angle subtended at the center by the arc is

1. π 2. π/2 3. π/3 4. π/5

Ans: 2

100 cm circumference subtends 360°
∴ 25 cm arc will subtend 90°

48. The equation $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is true if

1. x =a tan θ, y = b cot θ
2. x = a sec θ, y = b cosec θ
3. x = a cosθ, y = b sin θ
4. x = a y = b

Ans:3

Explanation

Determine $\frac{x^2}{a^2} + \frac{y^2}{b^2}$ for all options:

Option (1) → $\tan^2\theta + \cot^2\theta \neq 1$ for most of the values of θ

Option (2) → $\sec^2\theta + \operatorname{cosec}^2\theta \neq 1$

Option (3) → $\sin^2\theta + \cos^2\theta = 1$

Option (4) → 1+1=2

Option 3 only satisfies the given condition.

49. Simplify: $\frac{(2^2)^3+(2^3)^2}{4}$

Ans.

$\frac{(2^2)^3+(2^3)^2}{4}=\frac{2\times 2^6}{2^2} = 2^5 = 32$ or $\frac{4^3+8^2}{4} = \frac{128}{4} = 32$

50. The mean/average of the cubes of the first n natural number is

1. $\frac{n(n+1)^2}{4}$ 2. n^2 3. $\frac{n(n+1)(n+2)}{8}$ 4. None

Ans: 1.

Explanation

The sum of cubes of the first n natural numbers = $\frac{[n(n+1)]^2}{4}$

∴ Their average $= \frac{[n(n+1)]^2}{4} \div n = \frac{n(n+1)^2}{4}$