1. The angle which is twice it supplementary is

1. 120^o 2. 60^o 3. 150^o 4. None

Ans: 1

Explanation

$Let\ the\ angle\ be\ x\ and\ its\ supplement = 180 - x$

$It\ is\ given\ that: x = 2(180 - x) \rightarrow 3x = 360 \rightarrow x = 120.$

2. Find the value of $\log_3 9 + \log_3 12 - \log_3 4$

1. zero 2. 1 3.2 4. 3

Ans:4

Explanation

The given sum is: $\log_3 \frac{9 \times 12}{4} = \log_3 27 = \log_3 3^3 = 3\log_3 3 = 3$

3. If $x+y = 7$ and $x^2 + y^2 = 25$, find the value of $[\frac{1}{x}] + [\frac{1}{y}]$

1. 7/25 2. 25/7 3. $\frac{7}{12}$ 4. 12/7

Ans:3

Explanation

$\frac{1}{x} + \frac{1}{y} = \frac{x+y}{xy} = \frac{x+y}{\frac{1}{4}[(x+y)^2 - (x^2 - y^2)]} = \frac{7x2}{7^2 - 25} = \frac{14}{7^2 - 25} = \frac{14}{24} = \frac{7}{12}$

4. The equation $x^2 - 5x + 6 = 0$ represents

1. A pair of straight lines through origin 2. Two perpendicular straight lines
3. A circle 4.A parabola

Ans:4

Explanation

The given quadratic equation $(x^2 - 5x + 6) = 0$ is of the form $ax^2 + bx + c = 0$ which is the general equation for a parabola and its graph is shown below.

Box. Polynomial equations

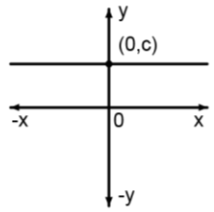
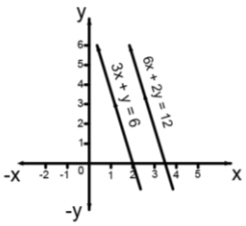
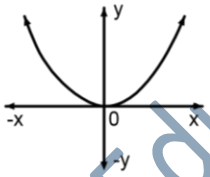
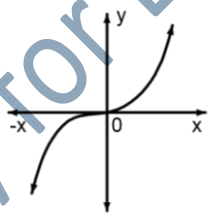
Degree	Name	Example
1	Constant	
2	Linear	
3	Quadratic	
4	Cubic	
etc	...	...

Figure : Polynominal names.

5. If the variance of five values is 15.6, what is the standard deviation of these values?

1. 3.95 2. 4.35 3. 2.85 4. 2.56

Ans:1

Explanation

Standard deviation, SD = $\sqrt{\text{variance}} = \sqrt{15.6} = 3.95$

6. Find the value of $(65^2 - 15^2)/(65-15) + (65^2 - 15^2)/(65+15)$

1.975 2. 80 3. 50 4. 130

Ans: 4

Explanation

Given sum is of the form = $\frac{a^2-b^2}{a-b} + \frac{a^2-b^2}{a+b}$ = a+b +a-b = 2a

= 65 × 2 = 130

7. The areas of three adjacent sides of a cuboid are l, b and h. Its volume is

1. $\sqrt{lbh}$ 2. lbh 3. $l^2b^2h^2$ 4. None

Ans: 1

Explanation

3 sides are given by $\sqrt{\ell}, \sqrt{b}, \sqrt{h}$

∴ Volume == $\sqrt{\ell} \times \sqrt{b} \times \sqrt{h} = \sqrt{lbh}$

8. Find the sum of $1^3 + 2^3 + 3^3 + \ldots.. 10^3$

1. 3025 2. 2025 3. 3675 4. 2675

Ans: 1

Explanation

The sum of given numbers $= \left\{\frac{n(n+1)}{2}\right\}^2$ where n = 10

$= \left(\frac{10 \times 11}{2}\right)^2$

= 55 × 55 = 3025

9. For non-zero numbers a and b, $\left(\frac{a}{b}\right)^m \div \left(\frac{a}{b}\right)^n$, where m > n , is equal to

1) $\left(\frac{a}{b}\right)^{mn}$ 2) $\left(\frac{a}{b}\right)^{m+n}$ 3) $\left(\frac{a}{b}\right)^{m-n}$ 4) $\left(\left(\frac{a}{b}\right)^m\right)^n$

Ans: 3.

10. The number of years for an amount of money to treble at 16% simple interest is :

1. 12 ½ 2. 10 3. 8 ½ 4. 6

Ans:1

Explanation

For simple interest case, Sum, A= P + $\frac{PNR}{100}$

It is given that, $3P = \left(P + \frac{PNR}{100}\right)$

$3P = P + \frac{PN \times 16}{100}$

$2P = \frac{PN \times 16}{100} \rightarrow 2 = \frac{16N}{100}$

$\therefore N = 12\frac{1}{2}$

11. If the radius of a sphere is increased by 50% then the increase in the surface area of the sphere will be:

1.100% 2.125% 3.150% 4.200%

Ans:2

Explanation

Surface area of sphere, $S = 4\pi r^2$,

As per given condition, $r \rightarrow 1.5r$

$\therefore S \rightarrow 4\pi (1.5r)^2 = 4\pi \times 2.25r^2 = 2.25$ times;

Therefore increase in surface area is 1.25 times, i.e., 125%

12. If all the sides of a parallelogram touch a circle, then the parallelogram must necessarily be a:

1. Square 2. Rectangle 3. Rhombus 4. None of these

Ans: 2

Note: If all the sides of a parallelogram touch a circle, then the parallelogram must necessarily be a rectangle. Also, if all the sides of a rhombus touch a circle, then the rhombus must necessarily be a square.

13. A can do a piece of work in 'p' days and B can do the same work in 'q' days. Then the number of days in which A and B can together do that work is

1. $\frac{p+q}{2}$ 2. $\frac{1}{p} + \frac{1}{q}$ 3. $\frac{pq}{p+q}$ 4. pq

Ans.3.

Explanation

A's one day's work $= \frac{1}{p}$;

B's one day's work $= \frac{1}{q}$;

(A +B)'s one day's work $= \frac{1}{p} + \frac{1}{q}$;

Hence, A and B both can do that work = $\frac{1}{\frac{p+q}{pq}}=\frac{pq}{p+q}$.

14. A shopkeeper marks his goods 40% above the cost price and allows a discount of 25% and his gain % is

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

Ans. 1

Explanation

Assume CP = 100

The sale structure: CP → marked price → discounted price

Marked price = 1.4×CP;

Price after discount = 0.75×1.4×CP= 1.05×CP;

% gain = (1.05 CP-CP)×$\frac{100}{CP}$ = 5%.

15. The ratio of the ages of two boys is 3:4. After 3 years, the ratio will be 4:5.The ratio of their ages after 21 years will be

1. 14:17 2. 17:19 3. 11:12 4. 10:11

Ans. 4

Explanation

Let the present ages of the boys be 3x and 4x;

After 3 years, ages relation is $\frac{3x+3}{4x+3} = \frac{4}{5}$ =→x=3;

Hence, the present ages 3x and 4x is 9 and 12 respectively.

Ratio of ages after 21 years is = $\frac{9+21}{12+21}=\frac{30}{33}$ = 10: 11

16. The cost price of 25 books is equal to the selling price of 20 books. The profit percentis

1. 20% 2. 22% 3. 24% 4. 25%

Ans. 4

Explanation

25× CP = 20×SP;

∴ The cost price of 25 books= 20 books' selling piece

Profit = the selling price of 5 books

= $\frac{5}{20}$ = 25%

17. One number is 25% of another number. The larger number is 12 more than the smaller. The large number is

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

Ans. 2

Explanation

Let one number be = x and another number= 0.25x;

Given: The larger number, x = 0.25x+12→ x = $\frac{12}{0.75}$ = 16;

18. A train 500 m long, running at a uniform speed, passes a station in 35 s. If the length of the platform is 221 m, the speed of the train in km/hr is

1. $\frac{721}{35}$ 2. 74.16 3. 24.76 4. 78.54

Ans. 2

Explanation

Total distance travelled = Platform length 221 m + Train length 500 m = 721 m;

The train's speed =$\frac{\text{Distance}}{\text{time}}$ = $\frac{721}{35}$ = 20.6 m/sec = 20.6 x $\frac{18}{5}$ = 74.16 kmph.

19. If the simple interest on Rs. 400 for 10 years is Rs. 280, then rate of interest per annum is

1. 7% 2. 7½% 3. 7¼% 4. 8 ½ %

Ans. 1

Explanation

SI = $\frac{PNR}{100}$;

i.e., $\frac{400 \times 10 \times R}{100}$ = 280→R = 280×100/ (400×10) = 7%.

20. If 7 times the seventh term of an Arithmetic Progression (AP) is equal to 11 times its eleventh term, then the 18th term of the AP will be

1. 1 2. 0 3. 2 4. -1

Ans:2.

Explanation

Let the first term of AP is 'a' and uniform difference is 'd'.

The 7^{th} term is a + 6d and the 11 term is a + 10d

It is given that: 7×(a + 6d) = 11×(a + 10d);

11a – 7a +110d – 42d =0→ 4a + 68d=0→ a =-17d;

The 18th term of AP = a + 17d = -17d + 17d =0;

21. If $x + \frac{1}{x} = 5$, then the value of $\frac{x}{1+x+x^2}$ is

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

Ans. 2

Explanation

Given sum/condition →$1 + x^2 = 5x$;

Put this value in $\frac{x}{1+x+x^2} = \frac{x}{x+5x} = \frac{1}{6}$;

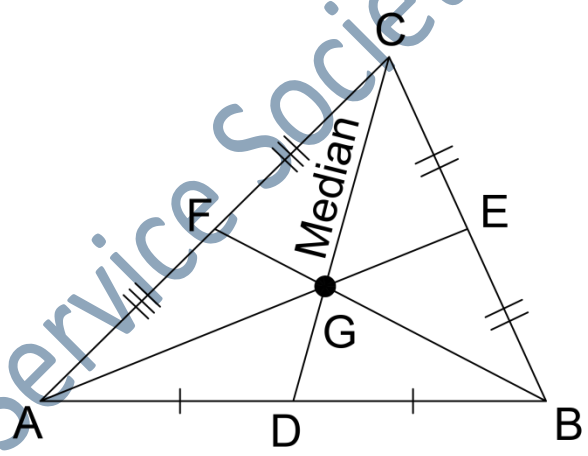
22. G and CD are respectively the centroid and median of the ΔABC. The ratio CG:CD is

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

Ans. 2

Explanation

It is a triangle's property; centroid of a triangle located on the median divides the median in 2:1 ratio from the apex (i.e., CG : GD = 2:1 and CG:CD 2:3). AE, BF and CD are medians.



23. 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

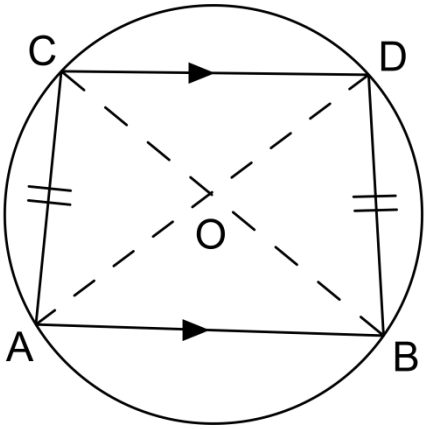
4. No definite relation exists

Ans: 1

Explanation: It can be a isosceles trapezium.

Properties of isosceles trapezium:

In any isosceles trapezoid, two opposite sides (the bases) are parallel, and the two other sides (the legs) are of equal length (properties shared with the parallelogram). The **diagonals are also of equal length**.



ABCD is a trapezium in which AB is parallel to CD. No rhombus or parallelogram can be laid in a circle, i.e., rhombus and parallelogram are not cyclic quadrilateral.

24. If $\sin\theta + \cos\theta = 1$, then the $\sin\theta\cos\theta$ is equal to

1. 0 2. 1 3. ½ 4. $-\frac{1}{2}$

Ans:1.

Explanation: Given: $\sin\theta + \cos\theta = 1$;

Squaring both sides→ $\sin^2\theta + \cos^2\theta + 2\sin\theta\cos\theta = 1 \rightarrow 2\sin\theta \times \cos\theta = 0$;

($\because \sin^2\theta + \cos^2\theta = 1$)

25. The average age of eight teachers in a school is 40 years. A teacher among them passed away at the age of 55 years whereas another teacher whose age was 39 years joined them. The average age of the teachers in the school now is (in years)

1. 35 2. 36 3. 38 4. 39

Ans. 3.

Explanation

Let the ages of eight teachers be $A_1, A_2, \ldots\ldots, A_8$;

Sum of their ages: $A_1 + A_2 + \ldots\ldots + A_8 = 40 \times 8 = 320$;

The total ages after a teacher of age 55passed away and another teacher of age 39 years joined: $A_1 + A_2 + \ldots\ldots + A_8 = 320 - 55 + 39 = 304$;

The required average = $\frac{304}{8}$ = 38 years;

26. Which power of 8 is equal to 2^6 ?

1) 3 2) 2 3) 1 4) 4

Ans: 2

$8^x = 2^6$ i.e., $2^{3.x} = 2^6$
i.e ., $3x = 6 \rightarrow x = 2$

27. If $2x + \frac{2}{x} - 3$, then the value of $x^3 + \frac{1}{x^3} + 2$ is

1.3/4 2.4/5 3.5/8 4. 7/8

Ans: 4

Explanation

Given: $2x + \frac{2}{x} - 3 \rightarrow x + \frac{1}{x} = \frac{3}{2}$;

$\left(x + \frac{1}{x}\right)^3 = x^3 + \frac{1}{x^3} + 3\left(x + \frac{1}{x}\right)$

$x^3 + \frac{1}{x^3} + 2 = \left(x + \frac{1}{x}\right)^3 - 3\left(x + \frac{1}{x}\right) + 2 = \left(\frac{3}{2}\right)^3 - 3\left(\frac{3}{2}\right) + 2$

$\frac{27}{8} - \frac{9}{2} + 2 = \frac{27-36}{8} + 2 = -\frac{9}{8} + 2 = \frac{7}{8}$;

28. Two equal circles of radius 3 cm each and distance between their centres is 10 cm. The length of one of their transverse common tangent is

1. 7cm 2. 9cm 3. 10cm 4. 8 cm

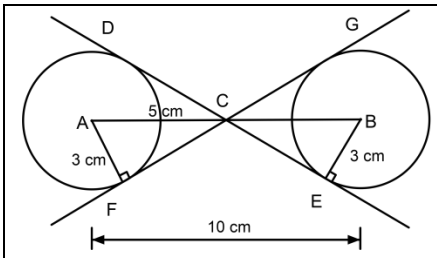
Ans:4

Explanation

Given: AB = 10 → AC = BC =5

ΔAFC is a right angled triangle.

FC = 4 → FG = DE = 8.



AB = 10 cm
AC = 5 cm
FC = CG

29. A sphere has the same curved surface area as a cone of vertical height 40 cm and radius 30 cm. The radius of the sphere is

1. $5\sqrt{5}$cm 2. $5\sqrt{3}$cm 3. $5\sqrt{15}$cm 4. $5\sqrt{10}$ cm

Ans:3

Explanation

Let the sphere's radius be r and cone radius be R, height h and slant height l.

The slant side of the cone=$\sqrt{R^2 + h^2} = \sqrt{40^2 + 30^2} = 50$

Given: Surface area of sphere, $4\pi r^2$ = Surface area of cone, πrl

i.e., $4\times\pi\times r^2 = \pi x30x50$

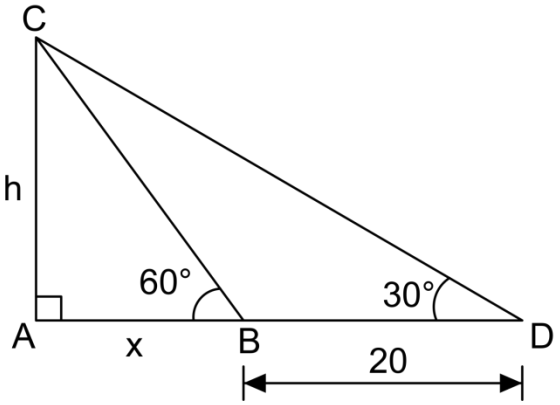
i.e., $r^2 = \frac{1500}{4} = 375 = 15x25 \rightarrow r = 5\sqrt{15}$

30. The angle of elevation of the top of a tower from a point A on the ground is 30˚. On moving a distance of 20 metre towards the foot of the tower to a point B, the angle of elevation increases to 60˚. The height of the tower in meters is-

1. $\sqrt{3}$ 2. $5\sqrt{3}$ 3. $10\sqrt{3}$ 4. $20\sqrt{3}$

Ans. 3

Explanation



In Triangle ABC,

tan 60°=$\sqrt{3}$ = h/x → h = $\sqrt{3}$ x ……..(1)

In triangle ADC, tan30= $\frac{1}{\sqrt{3}} = \frac{h}{x+20}$ → $\sqrt{3}$ h= x + 20 ……(2)

From Eqn. (1), put the value of h in Eqn. (2):

$\sqrt{3}$.$\sqrt{3}$x = 3x = x + 20 → x =10 m;

Hence, from Eqn.(1) the height of tower = 10$\sqrt{3}$m;

31. A & B together finish a job in 24 days, while A, B & C together can finish the same job in 8 days. C alone will finish the job in

1. 12days 2. 14days 3. 16days 4. 24 days

Ans. 1

Explanation

A + B+ C' s one day work $=\frac{1}{8}$

A + B's one day work $=\frac{1}{24}$

∴ C's one day work = $\frac{1}{8} - \frac{1}{24} = \frac{3-1}{24} = \frac{1}{12}$

∴C can finish the work in 12 days.

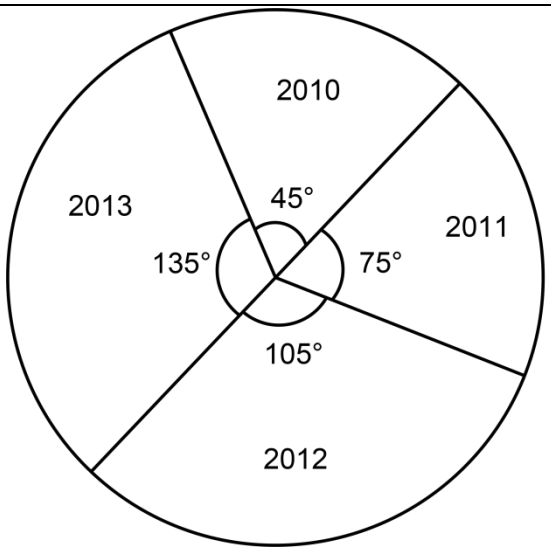
32. Given here is a pie chart of the cost of gold in 2010, 2011, 2012 and 2013. Study the chart and answer the following questions: If the price of gold in 2013 is Rs. 31,500 per 10 gram, then the price of gold in 2011 per 10 gram is

1. Rs.17000 2. Rs.17500 3. Rs.18000
4. Rs.18500

Ans. 2

Explanation

The required price of gold in 2011 per 10 gram = $\left(\frac{75}{135}\right)$× 31500 = Rs. 17500.



33. The original price of a TV set is Rs. 6,000. If the price is discounted by 20% and then raised by 10% for service contract, the price charged by the shopkeeper is

1. Rs.5400 2. Rs.5280 3. Rs.5100 4. Rs.4200

Ans. Rs. 5280

Explanation:

Original price = Rs. 6000;

Price after 20% discount = 6000 – 1200 = Rs. 4800;

Price after adding service contract of 10% = 4800 + 480 = Rs. 5280

34. Area of the circle inscribed in a square of diagonal $6\sqrt{2}$ cm (in sq. cms) is

1. 9π 2. 6π 3. 3π 4. $9\sqrt{2}\pi$

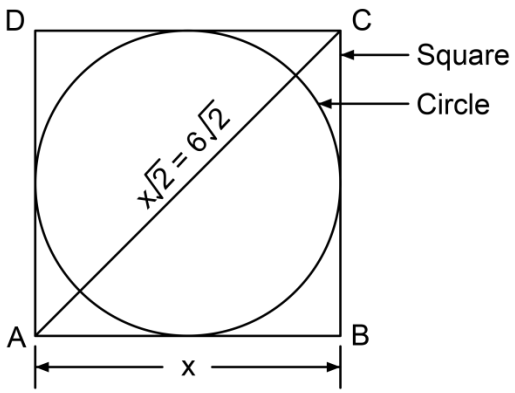
Ans. 1

Explanation

Diagonal of square = side$\times\sqrt{2} = 6\sqrt{2}$ → Square side, a = 6 cm;

Side of square = Diameter of circle= 6 cm→ Circle radius, r = 3 cm;

Hence, the area of circle $\pi r^2 = 9\pi$ sq. cm



35. A certain sum of money was divided between A, B and C in the ratio 5:6:9. If A received Rs. 450, the sum divided was

1. 2000 2. 1800 3. 2250 4. 1000

Ans. 2

Explanation:

Let the share of A, B, and C be 5x, 6x, and 9xrespectively and hence the total sum is 20x

From the given condition, 5x = 450→ x = 90;

Hence, the total sum = 20x = 20×90 = Rs. 1800.

36. By selling a bag at Rs. 230, profit of 15% is made. The selling price of the bag, when it is sold at 20% profit would be

1. Rs.250 2. Rs.205 3. Rs.240 4. Rs.200

Ans. 3

Explanation

Let the cost price of the bag, CP beRs. x;

Given Sp at 15% profit: x + 0.15x = 230

∴ x = Rs. 200 (i.e., CP);

Selling price if the profit is 20% = 200 + 20% of 200 = Rs. 240

37. The weights of two iron balls are 3.5 kg and 7.5 kg. What is the percentage weight of the 1st ball with respect to 2nd ball.

$1.46\frac{2}{3}\%$ 2.35% $3.46\frac{1}{3}\%$ 4.45%

Ans. 1

Explanation

The required percentage = $100\times\frac{3.5}{7.5} = \left(\frac{140}{3}\right)\%$.

38. Which of the following has the least value?

1) 0.001 2) $\frac{1}{10000}$ 3) $\frac{1}{10^6}$ 4) $\frac{1}{10^6} \div 0.1$

Ans:3

Note: The given options are a. 0.001, b 0.0001 , c. 0.000001, d. $\frac{1}{10^6} \div \frac{1}{10} = \frac{1}{10^5}$

39. Square of $\left(\frac{-2}{3}\right)$ is equivalent to

1) $\frac{4}{-9}$ 2) $\frac{-4}{9}$ 3) $\frac{4}{9}$ 4) None

Ans:3 (Note: the sum is $\frac{-2}{3} . \frac{-2}{3} = \frac{4}{9}$)

40. Cube of $\left(\frac{-1}{4}\right)$ is

1) $\frac{-2}{12}$ 2) $\frac{1}{16}$ 3) $\frac{-1}{64}$ 4) $\frac{1}{64}$

Ans:3. (Note: $\left(\frac{-1}{4}\right) .\left(\frac{-1}{4}\right) .\left(\frac{-1}{4}\right) = \frac{-1}{64}$)

41. Which of the following is not equal to 1?

1) $\frac{2^3 \times 3^2}{4 \times 18}$ 3) $[(-2)^3 \times (-2)^4] \div (-2)^7$

3) $\frac{3^0 \times 5^3}{5 \times 25}$ 4) $\frac{2^4}{(7^0+3^0)^3}$

Ans:4

42. If the diagonals of a rhombus are equal, then it is a

1. rectangle 2. square

3. Kite or deltoid 4. none of these

Ans: 2

43. Which of the following equation(s) will pass through origin?

1. y= mx + c 2. y = mx 3. y = -mx 4.Both (2) and (3) above

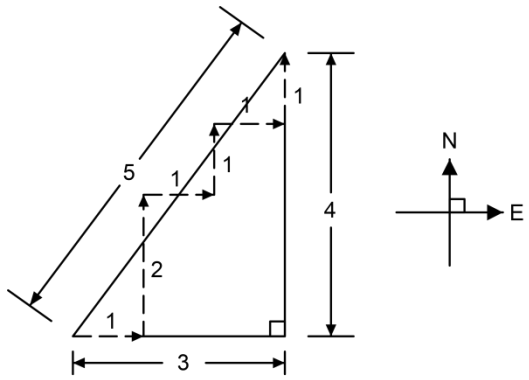
Ans: 4

44. A man at point A walks 1 KM east, then 2 KM north, then 1 KM east, then 1 KM north, then 1 KM east, then 1 KM north to arrive at point B. From point B, what is the shortest distance to point A in KM ?

1. 7 2. 6 3. 5 4. 2.5

Ans: 3

The distance walked is shown below:



45. Which one is true?

1. Similar triangles are congruent
2. Congruent triangles are similar
3. Similar triangles are equal in area
4. None of these

Ans:2

46. The outer measures of a closed wooden box of thickness 1 cm are 32 cm x 20 cm x 17 cm. Its capacity is

1. 10880 cm^3 2. 8100 cm^3 3. 9424 cm^3 4. none of these

Ans: 2

Explanation: Inner measures are 30cm x 18 cm x 15 cm

∴ Its volume or internal capacity is = 30 x 18 x 15=8100

47 If every side of a cube of volume V is doubled, its volume become kV. Therefore k is equal to

1. 2 2. 4 3. 8 4. None

Ans:3

Explanation:

$V = a^3$

$a \rightarrow 2a \ \therefore \ V \rightarrow (2a)^3 = 8a^3 = 8V = k.V, \therefore \ k = 8.$

48. The length of the longest pole that can be kept inside a room 12 m x $3\sqrt{3}$ m x 5 m is

1. 10 m
2. $12\sqrt{3}$ m
3. 14 m
4. $15\sqrt{3}$ m

Ans:3

Explanation

Longest dimension of a room or cube $= \sqrt{l^2 + b^2 + h^2} = \sqrt{12^2 + \{3(\sqrt{3})\}^2 + 5^2}$

$= \sqrt{144 + 27 + 25} = \sqrt{196} = 14$

49. A metal pipe has an external radius of 4 cm and an internal radius of 3 cm. Find the volume of the metal if its length is 10 cm

1. 344 cm^3
2. 220 cm^3
3. 440 cm^3
4. None

Ans: 2

Explanation

Given: R =4 cm, r = 3 cm and length L =10cm

Volume, $V = \pi (R^2 - r^2) L = \pi (4^2 - 3^2) \times 10 = \frac{22}{7} \times 7 \times 1 \times 10 = 220$

50. $\left(\frac{2}{3}\right)^3 \times \left(\frac{5}{7}\right)^3$ is equal to

1) $\left(\frac{2}{3} \times \frac{5}{7}\right)^9$
2) $\left(\frac{2}{3} \times \frac{5}{7}\right)^6$
3) $\left(\frac{2}{3} \times \frac{5}{7}\right)^3$
4) $\left(\frac{2}{3} \times \frac{5}{7}\right)^9$

Ans:3