TNPSC DEO PRELIMINARY EXAM [02.03.2019]

APTITUDE & MENTAL ABILITY SOLUTIONS

1. If the average of the values 9, 6, 7, 8, 5 and x is 8. Find the value of x.

A. 12 **B. 13** C. 10 D. 9

Explanation:

$$\Rightarrow \frac{9+6+7+8+5+x}{6} = 8$$

$$\Rightarrow 35 + x = 48$$

$$\Rightarrow x = 48 - 35 = 13$$

2. Find the standard deviation of 40, 42 and 48. If each value is multiplied by 3, find the standard deviation of the new data.

A. $\frac{\sqrt{104}}{3}$ B. $\sqrt{132}$ C. $\sqrt{104}$ D. $\frac{\sqrt{104}}{2}$

Explanation:

Where, $d = x - \bar{x}$

$$\text{Mean}(\bar{x}) = \frac{40+42+48}{3} = \frac{130}{3}$$

	d^2
$d = 40 - \frac{130}{3} = -\frac{10}{3}$	$100/9$
$d = 42 - \frac{130}{3} = -\frac{4}{3}$	$16/9$
$d = 48 - \frac{130}{3} = \frac{14}{3}$	$196/9$

$$\Sigma d^2 = \frac{100+16+196}{9} = \frac{312}{9} = \frac{104}{3}$$

$$\sigma = \sqrt{\frac{104/3}{3}} = \sqrt{\frac{104}{9}} = \frac{\sqrt{104}}{3}$$

Multiply by 3

$$\text{New } \sigma = 3 \times \frac{\sqrt{104}}{3} = \sqrt{104}.$$

3. Which one of the following cannot be lengths of sides of a triangle.

A. 4 cm, 11 cm, 16 cm B. 5 cm, 9 cm, 13 cm

C. 6 cm, 8 cm, 12 cm D. 7 cm, 10 cm, 11 cm

Explanation:

Largest side < Sum of other two sides.

(A) 16 < 15

4. Find the number of days form 21st February 1900 to 4th June 1900.

A. 105 B. 103 C. 102 **D. 104**

Explanation:

1900 is not divisible by 4 [Not a leap year]

Feb 21 to Feb 28 = 8 days

March = 31 days

April = 30 days

May = 31 days

June = 4 days

Total = 104 days

5. A man ate 100 grapes in 5 days. Each day, he ate 6 more grapes than those he ate on the earlier day. How many grapes did he eat on the first day?

A. 8 B. 12 C. 76 D. 54

Explanation:

Let the grapes eaten on 1st day=a

Then according to question, we get;

(a)+(a+6)+(a+6+6)+(a+6+6+6)+(a+6+6+6+6)=100.

5a+60=100

5a=100–60

5a=40

a=8.

Hence, no. of grapes eaten on 1st day=8.

6. A 220 m long train is running at a speed of 60 km/H. In how much time will it cross a platform of length 460 m?

A. 41.5 seconds B. 38.7 seconds

C. 40.8 seconds D. 42.4 seconds

Explanation:

$$\text{Time} = \frac{\text{Train Length + platform Length}}{\text{Train Speed}}$$

$$= \frac{220 + 460 \text{ m}}{60 \times \frac{5}{18} \text{ m/s}} = \frac{680}{60 \times 5} \times 18$$

$$= \frac{204}{5} = 40.8 \text{ Seconds}$$

7. The standard deviation of 10 observation is $4\sqrt{2}$. If each observation is multiplied by 3. Find the new standard deviation.

A. $\sqrt{2}$ B. $2\sqrt{3}$ **C.** $12\sqrt{2}$ D. $3\sqrt{2}$

Explanation:

- Standard deviation of a collection of data gets multiplied or divided by the quantity k, if each item is multiplied or divided by k.

  (கொடுக்கப்பட்ட விவரத்திலுள்ள ஒவ்வொரு எண்ணையும் (மதிப்பு) ஒரு மாறிலி k ஆல் பெருக்க அல்லது வகுக்கக் கிடைக்கும் புதிய மதிப்புகளின் திட்ட விலக்கமானது, பழைய திட்டவிலக்கத்தை மாறிலி k ஆல் பெருக்க அல்லது வகுக்கக் கிடைக்கும் எண்ணாக இருக்கும்.)

$$\text{New } S.D \text{ } (\sigma) = 4\sqrt{2} \times 3$$

$$= 12\sqrt{2}$$

8. A two digit number is such that the product of the digits is 12. When 36 is added to the number, they interchange their places. So which is the digit in unit place of given number?

A. 2 B. 3 C. 4 **D. 6**

Explanation:

$x \times y = 12$

possible value of (x, y) are $(2, 6)$ $(3, 4)$ $(4, 3)$ $(6, 2)$

$$\boxed{xy + 36 = yx}$$

$\Rightarrow 26 + 36 = 62$

Hence, Original Number = 26.

Unit digit (இலக்கம்) = 6.

9. ROSE : 912822 : : MICE: ?

A. 139322 **B. 14182422**

C. 13182422 D. 149322

Explanation:

Alphabetical order

R = 18th from first or 9th from Last

O = 15th from first or 12th from Last

S = 19th from first or 8th from Last

E = 5th from first or 22nd from Last

Similarly MICE ⇒ 13 - 9 - 3 - 5 (From first)

14 - 18 - 24 - 22 (From Last)

∴ Ans: B. 14182422

10. A man bought an old bicycle for ₹1,250. He spent ₹ 250 on its repairs. He then sold it for ₹ 1,400. Find his loss percentage.

A. 6.67% B. 6.60% C. 6.68% D. 6.65%

Explanation:

Cost Price of the bicycle = ₹1,250

Repair Charges = ₹250

Total Cost Price = 1250 + 250 = ₹1,500

Selling Price = ₹1,400

C.P > S.P., there is a Loss

Loss = Cost Price – Selling Price

= 1500 – 1400

= 100

Loss = ₹100

$$\text{Percentage of Loss} = \frac{Loss}{Cost\,Price} \times 100 = \frac{100}{1500} \times 100 = \frac{20}{3} = 6\frac{2}{3}\ \%$$

Loss % = 6.67%

11. Find the smallest whole number which is exactly divisible by $1\frac{2}{3}, 2\frac{1}{4}, 3\frac{1}{2}$ and $4\frac{1}{5}$

A. 252 B. 154 C. 322 D. 454

Explanation:

$\frac{4}{3}, \frac{9}{4}, \frac{7}{2}, \frac{21}{5}$

LCM of Fractions $= \frac{\text{LCM of Numerator}(4,9,7,21)}{\text{HCF of denominator}(3,4,2,5)}$

$= \frac{252}{1} = 252$

12. Find the least number which increased by 3 is exactly divisible by 10, 12, 14, 16.

A. 1680 **B. 1677** C. 1697 D. 1670

Explanation:

Required Number be x.

$x + 3 = \text{LCM}(10, 12, 14, 16)$

$x + 3 = 1680$

$\boxed{x = 1677}$

13. The LCM of two number is 36 times that of their HCF. The product of the numbers is 3600. Find their HCF.

A. 10 B. 15 C. 8 D. 20

Explanation:

$\boxed{L = 36 \times H}$

LCM x HCF = product of two Nos

$36H \times H = 3600$

$H^2 = 100$

$\boxed{H = 10}$

14. Simplify: $\left(\frac{x^4 - x^2y^2}{y^4 - x^2y^2}\right) \div \left(\frac{x^2}{y^2}\right)$

A. 1 B. 0 **C. -1** D. $\frac{x^2}{y^2}$

Explanation:

$$\Rightarrow \frac{x^2(x^2-y^2)}{y^2(y^2-x^2)} \times \frac{y^2}{x^2}$$

$$\Rightarrow \frac{x^2-y^2}{y^2-x^2} = \frac{x^2-y^2}{-(x^2-y^2)} = -1.$$

15. If A, B, C, D, E are Natural numbers and A + B = C, 2B = E, B + C = D, B + E = A

A. B, E, A, C, D B. E, B, C, A, D

C. B, C, E, A, D D. B, C, E, D, A

Explanation:

Let, $\boxed{B=1}$ $\Rightarrow 2B=E$

then $E=2$

$B+E=A \Rightarrow 1+2=A \rightarrow \boxed{A=3}$

$A+B=C \Rightarrow 3+1=4 \rightarrow C=4$

$B+C=D \Rightarrow 1+4=5 \rightarrow D=5$

$B=1,\ E=2,\ A=3,\ C=4,\ D=5$

Ans: A.

16. Simplify: $\left(\frac{\sqrt{900}+\sqrt{144}}{\sqrt{144}}\right)-\left(\frac{\sqrt{16}}{\sqrt[3]{8}}\right)+2$

A. $\frac{21}{8}$ B. $\frac{21}{12}$ C. $\frac{21}{4}$ **D.** $\frac{21}{6}$

Explanation:

$$\frac{30+12}{12} - \frac{4}{2} + 2$$

$$\frac{42}{12} - 2 + 2 \Rightarrow \frac{21}{6}.$$

17. A ribbon cut into 3 pieces in the ratio 3 : 2 : 7. If the total length of the ribbon is 24 m. Find the length of each piece respectively.

A. 6 m, 4 m, 14 m B. 14 m, 4 m, 8 m

C. 6 m, 16 m, 4 m D. 4 m, 6 m, 14 m

Explanation:

$\frac{24 \text{ m}}{3+2+7} \Rightarrow \frac{24}{12} = 2$

Each pieces are (3×2), (2×2), (7×2)

6 m, 4m, 14m.

18. Find the ratio form of 4 years to 8 months

A. 4 : 8 B. 8 : 4 C. 1 : 2 **D. 6 : 1**

Explanation:

48 months : 8 months

$\Rightarrow$ 6 : 1

19. If A : B = 4 : 6; B : C = 18 : 5; find the ratio of A : B : C.

A. A : B : C B. A : B : C

C. 12 : 5 : 18 D. 5 : 12 : 18

Explanation:

A : B C

4x3 : 6x3

18 5

12 : 18 : 5

20. The thickness of a hemispherical bowl is 0.25 cm. The inner radius of the bowl is 5 cm. Find the outer curved surface area of the bowl. (Take $\pi = \frac{22}{7}$)

A. 153.25 sq.cm **B. 173.25 sq.cm**

C. 145.25 cq. cm D. 163.25 sq.cm

Solution Let r, R and w be the inner and outer radii and thickness of the hemispherical bowl respectively.

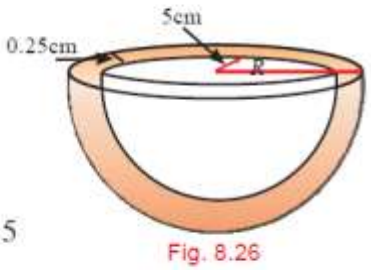


Fig. 8.26

Given that $r = 5\text{cm}, w = 0.25\text{cm}$

$\therefore \quad R = r + w = 5 + 0.25 = 5.25\text{cm}$

Now, outer surface area of the bowl $= 2\pi R^2$

$$= 2 \times \frac{22}{7} \times 5.25 \times 5.25$$

Thus, the outer surface area of the bowl = 173.25 sq.cm.

21. From which one of the following data the triangle ABC cannot be formed?

A. AB = BC = CA **B. AB = 2 BC = 3 CA**

C. 4 AB = 2 BC = 3CA D. AB = BC = 2CA

Explanation:

(A) $AB = BC = CA \Rightarrow$ Equilateral Triangle

(D) $AC = BC = 2CA \Rightarrow$ Isoceles Triangle

(C) $4AB = 2BC = 3CA = 12$ (Assume)

$\Rightarrow$ 3 : 6 : 4 $\rightarrow$ Largest side < Sum of other two sides.

$6 < 7$ ✓

(B) $AB = 2BC = 3CA \Rightarrow 6$

6 : 3 : 2 $\rightarrow$ $6 < 5$ ✗

$\rightarrow$ cannot be formed. Hence : Ans : B

22. Find the perimeter of a square whose area is equal to that of a circle with perimeter $2\pi r$

A. $2\pi r$ B. $\sqrt{\pi r}$ C. $4\sqrt{\pi}$ **D.** $4\sqrt{\pi r}$

Explanation:

Area of square = Area of circle

$$a^2 = \pi r^2$$

$$a = r\sqrt{\pi}$$

$\Rightarrow$ Perimetre of a square $= 4 \times a$

$= 4\sqrt{\pi}r$

Ans. D

23. A certain sum of money amounts to Rs. 6,372 in 3 years at 6% on simple interest. Find the principal.

A. Rs. 5,000 B. Rs. 4,500

C. Rs. 5,400 D. Rs. 4,000

Explanation:

$$P + S.I = \text{Amount}$$

$$P + \frac{P \times 3 \times 6}{100} = 6372$$

$$\frac{100P + 18P}{100} = 6372$$

$$P = \frac{6372 \times 100}{118}$$

$$P = 54 \times 100 = 5400$$

24. Vaideesh deposits ₹500 at the beginning of every month for 5 years in a post office. If the rate of interest is 7.5%. Find the amount he will receive at the end of 5 years.

A. ₹35718.75 B. ₹37518.75

C. ₹37581.75 D. ₹35817.75

Explanation:

Solution

$$\text{Amount deposited every month, P} = ₹\,500$$

$$\text{Number of months, } n = 5 \times 12 = 60 \text{ months}$$

$$\text{Rate of interest, } r = 7\frac{1}{2}\% = \frac{15}{2}\%$$

$$\text{Total deposit made} = Pn = 500 \times 60$$

$$= ₹\,30{,}000$$

$$\text{Period for recurring deposit, N} = \frac{1}{12}\left[\frac{n(n+1)}{2}\right] \text{ years}$$

$$= \frac{1}{24} \times 60 \times 61 = \frac{305}{2} \text{ years}$$

$$\text{Interest, I} = \frac{PNr}{100}$$

$$= 500 \times \frac{305}{2} \times \frac{15}{2 \times 100}$$

$$= ₹\,5{,}718.75$$

$$\text{Total amount due} = Pn + \frac{PNr}{100}$$

$$= 30{,}000 + 5{,}718.75$$

$$= ₹\,35{,}718.75$$

25. Fill in the blanks.
If a, b, c, l, m are in A.P, then the value of a – 4b + 6 c – 4l + m is =
A. 1 B. 2 C. 3 **D. 0**
Explanation:

a, b, c, l, m → A.P. Sequence
1, 2, 3, 4, 5

$a - 4b + 6c - 4l + m$
$1 - 8 + 18 - 16 + 5 = 24 - 24 = 0.$

26. If A denotes ×, B denotes + , C denotes ÷ and D denotes - , then find the value of 25D42C6B10A5
A. -52 B. -68 C. 52 **D. 68**
Explanation:

$25 - \frac{42}{6} + 10 \times 5$

$25 - 7 + 50 = 75 - 7 = 68$

27. Find the sum of the arithmetic series
5 + 11 + 17 +… + 95
A. 750 **B. 800** C. 850 d. 900
Explanation:

$S_n = \frac{n}{2}[a+l]$

$n = \left[\frac{l-a}{d}\right] + 1 = \left[\frac{95-5}{6}\right] + 1$
$= 15 + 1 = 16$

$S_n = \frac{16}{2}[5+95]$
$= 8 \times 100 = 800$

28. If the sum of two numbers is 256 and their difference is 16. Then find those two numbers?
A. 156, 100 B. 110, 146 **C. 120, 136** D. 118, 138
Explanation:

$$x + y = 256$$
$$x - y = 16$$
$$2x = 272 \rightarrow \boxed{x = 136} \quad \boxed{y = 120}$$

29. In a class of 20 students, 5 students have scored 76 marks each, 7 students have scored 77 marks each and 8 students have scored 78 marks each, then compute the mean of the

A. 77.51 **B. 77.15** C. 77.10 D. 77.01

Explanation:

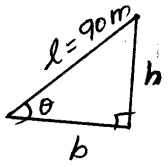
$$(76 \times 5) + (77 + 7) + (78 \times 8)$$
$$380 + 539 + 624 = 1543$$
$$\text{Average} = \frac{1543}{20} = 77.15$$

30. The length of a string between a kite and a point on a ground is 90 m. If the string makes an angle θ with the level of ground such that $\tan\theta = \frac{15}{8}$, how high is the kite?

A. 79 m B. 80 m **C. 79.41 m** D. 80.4 m

Explanation:

$\tan\theta = \frac{15}{8}$ - given



But

$$\tan\theta = \frac{\text{opp. side}}{\text{adj. side}} = \frac{h}{b}$$

$$\therefore \frac{h}{b} = \frac{15}{8}$$

$$b = \frac{8}{15}h$$

By Pythagoras Thm,

$$l^2 = h^2 + b^2$$

$$90^2 = h^2 + \frac{8^2}{15^2} h^2$$

$$90^2 = h^2\left(1 + \frac{8^2}{15^2}\right)$$

$$90^2 = h^2\left(\frac{15^2+8^2}{15^2}\right)$$

$$h^2 = \frac{90^2 \times 15^2}{17^2} \qquad (15^2+8^2 = 17^2)$$

$$h^2 = \frac{90 \times 15}{17}$$

$$h = 79.412\ m$$

31. Find the probability that a leap year selected at random will have 53 Fridays

A. $\frac{1}{7}$ **B.** $\frac{2}{7}$ C. $\frac{3}{7}$ D. 0

Explanation:

Now 52 weeks contain 52 Fridays and the remaining two days will be one of the following seven possibilities.
(Sun, Mon), (Mon, Tue), (Tue, Wed), (Wed, Thur), (Thur, Fri), (Fri, Sat) and (Sat, Sun).
The probability of getting 53 Fridays in a leap year is same as the probability of getting a Friday in the above seven possibilities.
Here S = (Sun,Mon),(Mon,Tue),(Tue,Wed),(Wed," Thur),(Thur,Fri),(Fri,Sat),(Sat,Sun),.
Then $n(S) = 7$.
Let A be the event of getting one Friday in the remaining two days.

$$p(A) = \frac{n(A)}{n(S)} = \frac{2}{7}$$

32. The average age of a family consist Father, Mother and a Child is 20. If after seven years the age of child will be 11. What was the average age when one day before the child is born?

A. 24 B. 20 C. 18 D. 16

Explanation:

$F + M + C = 20 \times 3 = 60$ Years

child age Now $= 11 - 7 = 4$ years.

at the time of child Birth,

Total Age of Family $= 60 - 12 = 48$ years.

One day Before Average age of family

$= \frac{48}{2} = 24$ years.

33. 20% of 25% of 20 is equal to

A. 1 B. 10 C. 20 D. 25

Explanation:

$\frac{20}{100} \times \frac{25}{100} \times 20$

$\frac{1}{5} \times \frac{1}{4} \times 20 = 1.$

34. Divya secured 46 marks out of 50 in Tamil, 27 marks out of 30 in English, 36 marks out of 40 in Maths and 54 marks out of 60 in Science. In which subject she get more marks?

A. Tamil B. English C. Maths D. Science

Explanation:

Tamil $= \frac{46}{50} \times 100 = 92\%$

Tamil $= \frac{46}{50} \times 100 = 92\%$

English $= \frac{27}{30} \times 100 = 90\%$

Maths $= \frac{36}{40} \times 100 = 90\%$

Science $= \frac{54}{60} \times 100 = 90\%$

35. Find the LCM of the following $x^3+y^3,(x^3-y^3),x^4+x^2y^2+y^4$

A. x^3+y^3 **B.** x^6-y^6 C. x^3-y^3 D. x^6+y^6

Explanation:

$x^3+y^3=(x+y)(x^2+y^2-xy)$

$x^3-y^3=(x-y)(x^2+y^2+xy)$

and $x^4+x^2y^2+y^4=\left[(x^4+y^4)+x^2y^2\right]=\left[(x^2+y^2)^2-2x^2y^2+x^2y^2\right]=(x^2+y^2)^2-x^2y^2$

$=(x^2+y^2-xy)(x^2+y^2+xy)$

So, LCM of these terms $=(x-y)(x+y)(x^2+y^2-xy)(x^2+y^2+xy)$

$=(x-y)(x^2+y^2+xy)(x+y)(x^2+y^2-xy)$

$=(x^3-y^3)(x^3+y^3)$

$=x^6-y^6$ $[\text{As } a^2-b^2=(a+b)(a-b)]$

36. The HCF of 0.90, 13.5 and 15 is

A. 0.3 B. 0.9 c. 0.5 d. 0.15

Explanation:

$\frac{9}{10}$ $\frac{135}{10}$ $\frac{15}{1}$

$HCF=\frac{\text{HCF of }(9,135,15)}{\text{LCM of }(10,10,1)}=\frac{3}{10}$

$=0.3$

37. Find the HCF (or) GCD of the following : $(x^3-x^2+x-1),(x^4-1)$

A. $(x-1)(x^2-1)$ B. $(x+1)(x^2-1)$

C. $(x-1)(x^2+1)$ D. $(x+1)(x^2+1)$

Explanation:

$(x^2+1)(x^2-1)=x^4-1$

(or)

$(x^2+1)(x+1)(x-1)$

$x^3-x^2+x-1=x^2(x-1)+1(x-1)$

$=(x^2+1)(x-1)$

$HCF=(x^2+1)(x-1)$

38. Simplify: $\sqrt{36a^4(b-c)^{16}} \div 2a(b-c)^2$

A. $18a^3(b-c)^8$ B. $3a(b-c)^4$

C. $3a(b-c)^2$ D. $3a(b-c)^6$

Explanation:

$\frac{6a^2(b-c)^8}{2a(b-c)^2} =$

Ans: $3a(b-c)^6$

39. Simplify: $2\frac{2}{3} - 3\frac{1}{6} + 6\frac{3}{4}$

A. $6\frac{1}{4}$ B. $6\frac{1}{2}$ C. $6\frac{4}{3}$ D. $5\frac{3}{4}$

Explanation:

$\frac{8}{3} - \frac{19}{6} + \frac{27}{4}$

$\frac{32 - 38 + 81}{12} = \frac{75}{12} = \frac{25}{4} = 6\frac{1}{4}$

40. If $\frac{a}{b} = \frac{3}{4}; \frac{b}{c} = \frac{5}{7}$ then a: b: c is

A. 15 : 20 : 28 B. 12 : 20 : 21

C. 3 : 9 : 7 D. 6 : 8 : 9

Explanation:

a b c

3 : 4

5 → 7

15 : 20 : 35

41. A hemispherical bowl of radius 60 cm is filled with soap paste. If this paste is made into cylindrical soap cakes each of radius 6 cm and height 2 cm, how many cakes do we get?

A. 1800 B. 1825 C. 2100 d. 2000

Explanation:

No. of cakes $= \frac{\frac{2}{3}\pi r^3}{\pi r^2 h} = \frac{\frac{2}{3} \times 60 \times 60 \times 60}{6 \times 6 \times 2}$

$= 2000.$

42. A brick measures 20 cm x 10 cm x 7.5 cm. How many bricks will be required for a wall 20 m x 2 m x 0.75 m?

A. 10,000 B. 15,000 C. 20,000 D. 25,000

Explanation:

No. of Bricks $= \frac{20 \times 100 \times 2 \times 100 \times 0.75 \times 100 \text{ cm}^3}{20 \times 10 \times 7.5 \text{ cm}^3} = 20,000$

43. The total surface area of a solid right circular cylinder is 231 cm². Its curved surface area is two thirds of the total surface area. Find the radius and height of the cylinder.

A. r = 3.5 cm, h = 7 cm B. r = 3.2 cm, h = 7 cm

C. r = 3.5 cm, h = 6 cm D. r = 3.2 cm, h = 6 cm

Explanation:

Solution: Given that total surface area = 231 cm²

Also given that curved surface area $= \frac{2}{3}$ of total surface area

$2\pi rh = \frac{2}{3} \times 231 (\because T.S.A = 231)$

$2\pi rh = \frac{2 \times 231}{3} = 2 \times 77 = 154 cm^2$

But total surface area = 231

(i.e.) $2\pi r(h+r) = 231$

$2\pi rh + 2\pi r^2 = 231$

$154 + 2\pi r^2 = 231$

$2\pi r^2 = 231 - 154$

$2\pi r^2 = 77$

$2 \times \frac{22}{7} \times r^2 = 77$

$r^2 = \frac{77 \times 7}{2 \times 22}$

$r^2 = \frac{7}{2} \times \frac{7}{2}$

$r = \frac{7}{2} = 3.5 cm$

Thus radius = 3.5 cm

Let us find height of the cylinder

Curved surface area $= 154\ cm^2$

i.e. $2\pi rh = 154$

$$2\times\frac{22}{7}\times\frac{7}{2}\times h = 154$$

$$= \frac{154}{22}$$

$= 7$ cm

Thus the height of the cylinder is 7 cm

44. The ratio between the base radius and the height of a solid right circular cylinder is 2.5. If its curved surface are is $\frac{3960}{7}$ sq.cm. Find the height and radius

A. h = 15 cm r= 6 cm B. h = 6 cm r = 15 cm

C. h = 14 cm r = 5 cm D. h = 5 cm r = 14 cm

Explanation:

Solution Let r and h be the radius and height of the right circular cylinder respectively.

Given that $r : h = 2 : 5 \implies \frac{r}{h} = \frac{2}{5}$. Thus, $r = \frac{2}{5}h$

Now, the curved surface area, $CSA = 2\pi rh$

$$\implies 2\times\frac{22}{7}\times\frac{2}{5}\times h\times h = \frac{3960}{7}$$

$$\implies h^2 = \frac{3960\times 7\times 5}{2\times 22\times 2\times 7} = 225$$

Thus, $h = 15 \implies r = \frac{2}{5}h = 6$.

Hence, the height of the cylinder is 15 cm and the radius is 6 cm.

45. A cone and a cylinder have the same base area and the same curved surface area. If the height of the cylinder is 2.5 m and radius of the cone is 3 m, then find the volume of the cone.

A. $15\pi m^3$ **B**. $12\pi m^3$ C. $36\pi m^3$ D. $7.5\pi m^3$

Explanation:

C.S.A of cylinder = C.S.A. of cone

$2\pi rh = \pi rl$

$2h = l$

$2\times 2.5 = 5 = l$ $\boxed{l = 5\ m}$

$l^2 = r^2 + h^2 \implies 25 = 9 + h^2$ $h^2 = 16$ $h = 4m$

Vol. of cone $= \frac{1}{3}\pi\times 3\times 3\times 4$

$= 12\pi\ m^3$

46. Find the difference between simple Interest and compound interest for a sum of Rs.8,000 lent at 10%p.a in 2 years

A. Rs.70 **B. Rs.80** C. Rs.60 D. Rs.90

Explanation:

$$P = \text{Diff} \times \left(\frac{100}{R}\right)^2$$

$$8000 = \text{Diff} \times \left(\frac{100}{10}\right)^2$$

$$\text{Diff} = \frac{8000}{100} = 80 \text{ Rs}$$

47. Two unbiased dice are rolled once. Find the probability of getting a doublet

A. $\frac{1}{2}$ B. $\frac{2}{3}$ **C.** $\frac{1}{6}$ D. 1

Solution: $n(S) = 36$

Let A be the event of getting a doublet.

Then A $= \{(1,1),(2,2),(3,3),(4,4),(5,5),(6,6)\}$

$\therefore n(A) = 6$

$$\therefore P(A) = \frac{n(A)}{n(S)} = \frac{6}{36} = \frac{1}{6}$$

48. Find the odd man out

A. Centre B. Radius C. Chord d. Diameter

Explanation:

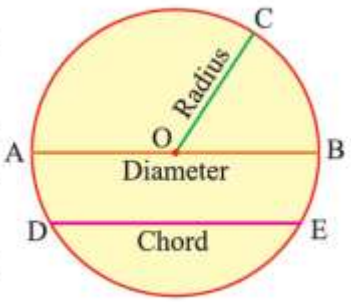
Parts of a Circle

The fixed point is called the centre of the circle.

The constant distance between the fixed point and the moving point is called the radius of the circle.

i.e. The radius is a line segment with one end point at the centre and the other end on the circle. It is denoted by 'r'.

A line segment joining any two points on the circle is called a chord.



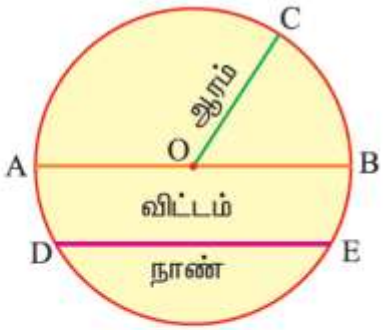
Diameter is a chord passing through the centre of the circle. It is denoted by 'd'.

The diameter is the longest chord. It is twice the radius.(i.e. $d = 2r$)

The diameter divides the circle into two equal parts. Each equal part is a semicircle.

வட்டத்தின் பாகங்கள்

நிலையான புள்ளி வட்டத்தின் மையம் எனப்படும். நிலையான புள்ளிக்கும், நகரும் புள்ளிக்கும் இடையே உள்ள மாறாத தூரம் ஆரம் எனப்படும்.



அதாவது வட்ட மையத்தை ஒரு முனையாகவும் வட்டத்தின் மேலுள்ள ஏதேனும் ஒரு புள்ளியை மற்றொரு முனையாகவும் கொண்ட கோட்டுத்துண்டு ஆரம் ஆகும். ஆரம் 'r' எனக் குறிக்கப்படும்.

வட்டத்தின் மேலுள்ள ஏதேனும் இரு புள்ளிகளை சேர்க்கும் கோட்டுத்துண்டு நாண் எனப்படும்.

வட்டத்தின் மையப்புள்ளி வழியாகச் செல்லும் நாண் விட்டம் எனப்படும். விட்டம் 'd' எனக் குறிக்கப்படும்.

மிக நீளமான நாண் விட்டமாகும். (அதாவது $d = 2r$)

வட்டத்தை இரு சமபாகங்களாக விட்டம் பிரிக்கிறது. ஒவ்வொரு பாகமும் அரைவட்டம் எனப்படும்.

49. Find the value of $\sqrt{75+\sqrt{33+\sqrt{4+\sqrt{25}}}}$

A. 9 B. 10 C. 12 D. 13

Explanation:

Take from End

$\sqrt{25} = 5$ $\sqrt{4+5} = \sqrt{9} = 3$

$\sqrt{33+3} = \sqrt{36} = 6$ $\sqrt{75+6} = \sqrt{81} = 9$