



# SSC CGL

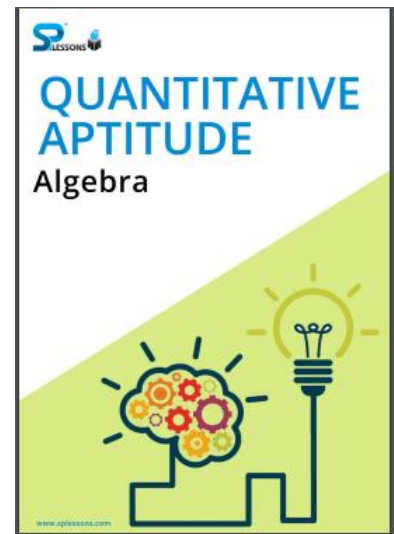
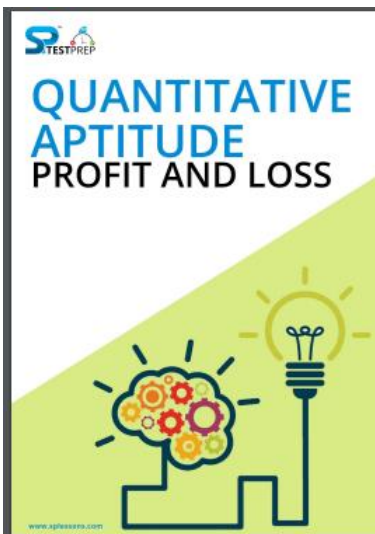
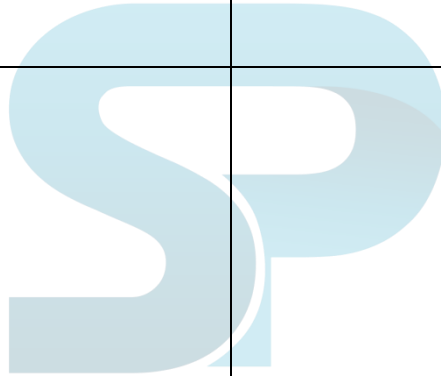
## QUANTITATIVE APTITUDE MOST IMPORTANT 50 QUESTIONS



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1. An article is sold for Rs. 2691 after successive discount of 8% and 22%. What is the marked price of the article?

- A. Rs. 4250
- B. Rs. 3750
- C. Rs. 4550
- D. RS. 3200

2. A train without stoppages travels with an average speed of 75 km/h and with stoppage; it travels with a average speed of 50 km/hr. For how many minutes does the train stop on an average per hour?

- A. 25 min/hr
- B. 30 min/hr
- C. 20 min/hr
- D. 15 min/hr

3. If  $x + \frac{1}{x} = 7$ , then  $x^3 + \frac{1}{x^3}$  is equal to.

- A. 322
- B. 243
- C. 564
- D. 128

4. A is 50% less efficient than B and C is 50% more efficient than A. Working together, they can finish a work in 8 days. In how many days will C alone complete 75% of that work?

- A. 15 days
- B. 12 days
- C. 25 days
- D. 18 days

5. If  $\cot \theta = 4$ , then  $\frac{5 \sin \theta - 2 \cos \theta}{5 \sin \theta + 2 \cos \theta}$  is equal to:

- A. 4/19
- B. 7/23
- C. 4/23
- D. 7/19

6. If  $\operatorname{cosec} 5\theta = \sec(\theta + 18^\circ)$ , then  $\theta$  is equal to: (a)  $14^\circ$  (b)  $12^\circ$  (c)  $20^\circ$  (d)  $8^\circ$  7. In a circle with center O, PQ is the diameter and RS is a chord such that PQRS is a trapezium. If  $\angle SPR = 20^\circ$ , then  $\angle RPQ$  is equal to.

- A.  $25^\circ$
- B.  $45^\circ$
- C.  $30^\circ$
- D.  $35^\circ$



7. In a circle with centre O, PQ is the diameter and RS is a chord such that PQRS is a trapezium. If  $\angle SPR = 20^\circ$ , then  $\angle RPQ$  is equal to

- A.  $25^\circ$
- B.  $45^\circ$
- C.  $30^\circ$
- D. 35

8. The value of  $\sin^2 43^\circ + \sin^2 47^\circ + \sin^2 30^\circ - \cos^2 45^\circ$  is equal to

- A.  $-1/4$
- B.  $3/4$
- C.  $4/5$
- D.  $2/3$

9.  $\Delta XYZ \sim \Delta TUS$  and  $XY = 6$ ,  $YZ = 10$  and  $ZX = 9$  If  $\text{ar}(\Delta XYZ) : \text{ar}(\Delta TUS) = 25:16$ , then US is equal to :

- A. 8 cm
- B. 10 cm
- C. 7.5 cm
- D. 6 cm

10. The diameter of a sphere is reduced by 20%. By what percent will its volume decrease?

- A. 50.2%
- B. 47.6%
- C. 44.2%
- D. 48.8%

11. The price of sugar is increased by 30%. A person wants to increase his expenditure by 4% only. By what percentage, should he reduce his consumption?

- A. 20%
- B. 25%
- C.  $16 \frac{2}{3}\%$
- D. 15%

12. A solid cube with an edge of 10 cm is melted to form two equal cubes. The ratio of the edge of the bigger cube to the smaller cube is.

- A.  $(3)^{1/3} : 1$
- B.  $(2)^{1/3} : 1$
- C. 8 : 1
- D. 2 : 1

13. The lateral surface area of a cone is  $462 \text{ cm}^2$ ; its slant height is 35 cm. the radius of the base of the cone is:

- A. 5.2 cm



- B. 4.8 cm
- C. 4.2 cm
- D. 6.4 cm

14.  $(1 - \sin A \cdot \cos A)(\sin A + \cos A) = ?$

- A.  $\sin^2 A - \cos^2 A$
- B.  $\sin^3 A + \cos^3 A$
- C.  $\cos^2 A - \sin^2 A$
- D. 0

15. The shadow of a vertical tower is found to be 80m longer when the sun's elevation is changed from  $60^\circ$  to  $45^\circ$ . What is height of tower?

- A.  $30(3\sqrt{3} + 1)m$
- B.  $50(1 + \sqrt{3})m$
- C.  $30(3 + \sqrt{3})m$
- D.  $40(3 + \sqrt{3})m$

16. LCM of two numbers is 1260 and their difference is 54. Then find the sum of these two numbers?

- A. 326
- B. 306
- C. 198
- D. 288

17. Find the number of zeros in the end of  $700!$  (a) 132 (b) 206 (c) 140 (d) 174

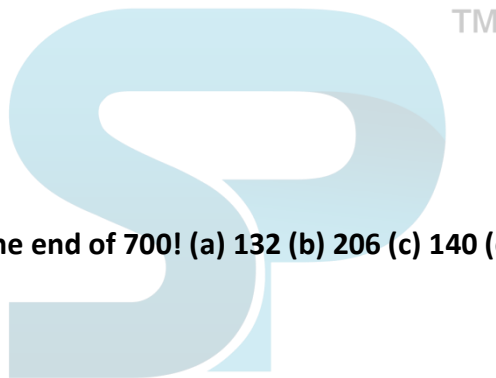
- A. 132
- B. 206
- C. 140
- D. 174

18. Atul and Ram invest in a business in the ratio 2:5. If 50% of the total profit goes to charity and Atul's share is Rs. 5600. The total profit is.

- A. 42300
- B. 39200
- C. 43200
- D. 48000

19. If  $p + q = 5$ ,  $p q = 3$ , then  $(p^3 + q^3)$  is equal to:

- A. 49
- B. 35
- C. 80
- D. 56





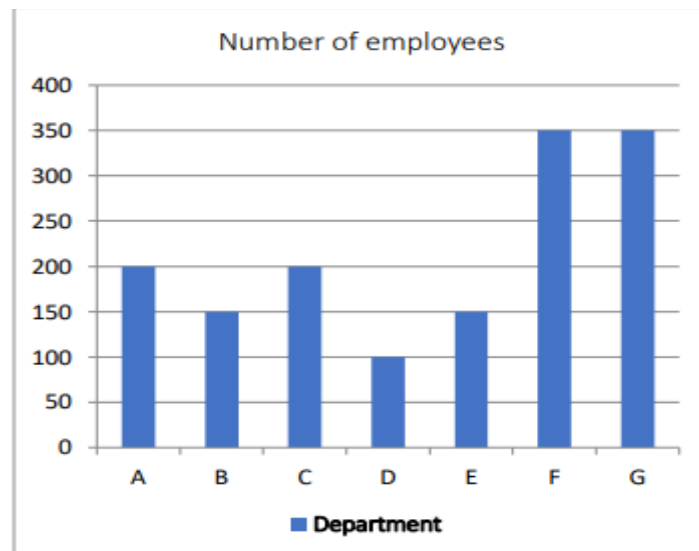
20. The difference between compound interest and simple interest on Rs  $x$  at 7% per annum for 2 years is Rs 98. What is the value of  $x$ ?

- A. 32,000
- B. 20,000
- C. 16,000
- D. 24,000

21. The efficiencies of Amit, Neeraj and Chiru are in the ratio 4: 5: 3. Working together they can complete a task in 10 days. In how many days will Chiru alone complete 30% of that task?

- A. 15 days
- B. 8 days
- C. 14 days
- D. 12 days

**Direction (22- 25):** The bar graph shows the number of employees working in the different departments of a company. Study the diagram and answer the following questions.



22. Which department has the lowest number of employees?

- A. C
- B. D
- C. A
- D. B

23. What is the ratio of number of employees of department A to that of department F?

- A. 7 : 4
- B. 5 : 7
- C. 7 : 5
- D. 4 : 7





24. The number of employees of department G is greater than those of department C by \_\_\_\_\_.

- A. 42.8%
- B. 75%
- C. 150%
- D. 84.2%

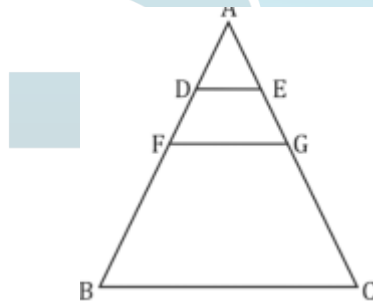
25. If the average compensation of an employee of department A is Rs 40,000 per month, then what is the total compensation (in Rs lakhs) of all employees of department A per month?

- A. 800
- B. 40
- C. 80
- D. 400

26. The median of an equilateral is  $12\sqrt{3}$  cm. The area (in  $\text{cm}^2$ ) of the triangle is (in  $\text{cm}^2$ )

- A.  $96\sqrt{3}$
- B.  $112\sqrt{3}$
- C.  $124\sqrt{3}$
- D.  $144\sqrt{3}$

27. In the triangle given below, D and E are mid points of AF and AG respectively. F and G are mid points of AB and AC respectively. If  $DE = 3.2$  cm, then BC is equal to



- A. 9.6 cm
- B. 12.8 cm
- C. 11.4 cm
- D. 14.2 cm

28. PA and PB are two tangents to a circle with center O, from a point P outside the circle. A and B are points on the circle. If  $\angle APB = 80^\circ$ , then  $\angle OAB$  is equal to

- A.  $40^\circ$
- B.  $20^\circ$
- C.  $30^\circ$
- D.  $35^\circ$



29. Neeraj sells 12 bicycles at a profit of Rs 516 per bicycle and sells 3 bicycles at a loss of Rs 129 per bicycle. If the total profit percentage on all the bicycles sold is 30%, the cost price per bicycle is (in Rs)

- A. 1120
- B. 1320
- C. 1460
- D. 1290

30. A mobile cover costing Rs 284 is available at a discount of 12%. What would be the selling price of 6 such mobile covers?

- A. Rs 1498.2
- B. Rs 1298.2
- C. Rs 1698.2
- D. Rs 1598.2

31. The efficiency of A is thrice as that of B and efficiency of B is twice as that of C. If B alone can finish a work in 20 days, in how many days A and C together will complete that work?

- A. 4 2 7 days
- B. 5 5 7 days
- C. 5 6 7 days
- D. 4 3 7 days

32. A diagonal of quadrilateral is 50 cm. The sum of length of the perpendiculars from opposite vertices is 17.3 cm. The area of the quadrilateral is (in  $\text{cm}^2$ )

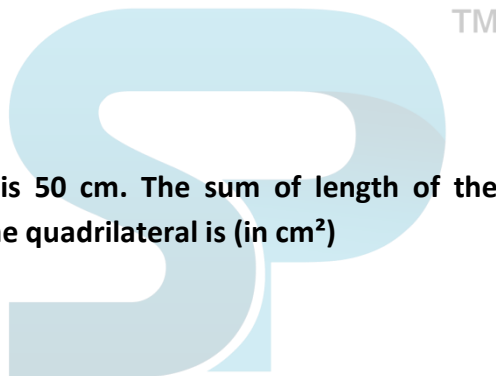
- A. 396.5
- B. 402.5
- C. 416.5
- D. 432.5

33. If  $a^3 - b^3 = 496$  and  $a - b = 8$ , then  $(a + b)^2 - ab$  is equal to

- A. 52
- B. 62
- C. 72
- D. 82

34. The speed of a boat in still water is 8 km/hr. If it takes 4 times as much time as going upstream as in going same distance downstream, then the speed of the stream is

- A. 7.2 km/h
- B. 6.4 km/h
- C. 4 km/h
- D. 4.8 km/h





35. The top of a broken tree touches the ground at an angle of  $60^\circ$  and at a distance of 35 cm from the base of the tree. Find the height of tree? (Use  $\sqrt{3} = 1.73$  and  $\sqrt{2} = 1.41$ )

- A. 60.55 cm
- B. 120.55 cm
- C. 125.33 cm
- D. 130.55 cm

36. There are 50 paise, 25 paise and Rs 1 coins in a bag in the ratio 5: 8: 1. If the total value of all the coins is Rs 110, then how many 25 paise coins are there in the bag?

- A. 80
- B. 120
- C. 160
- D. 180

37. On what sum of money, the interest per one year at 12% p.a. compounded half yearly is Rs 1854?

- A. Rs 15,000
- B. Rs 18,000
- C. Rs 20,000
- D. Rs 24,000

38. If  $(2x - 5)^3 + (x - 6)^3 + (x - 13)^3 = 3(2x - 5)(x - 6)(x - 13)$ , then what is the value of x?

- A. 6
- B. 5
- C. 4
- D. 3

39.  $7 - \{4 \times 4 - (-10) \times 8 \div (-4)\}$  is equal to

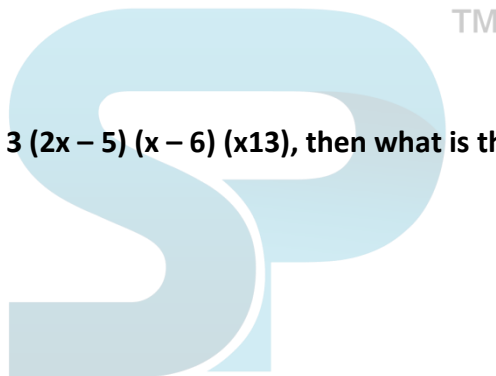
- A. 12
- B. 11
- C. 10
- D. 9

40. What is the volume of wood required to make a closed box of thickness 2.5 cm with external dimensions  $100 \text{ cm} \times 85 \text{ cm} \times 60 \text{ cm}$ ?

- A.  $82,000 \text{ cm}^2$
- B.  $86,000 \text{ cm}^3$
- C.  $90,000 \text{ cm}^3$
- D.  $92,000 \text{ cm}^3$

41. Find the value of  $\cos 15^\circ - \sin 45^\circ$

- A.  $\frac{\sqrt{3}+1}{2\sqrt{2}}$





- B.  $\frac{\sqrt{3}-1}{2\sqrt{2}}$
- C.  $\frac{\sqrt{3}}{2\sqrt{2}}$
- D.  $\frac{\sqrt{3}+2}{2\sqrt{2}}$

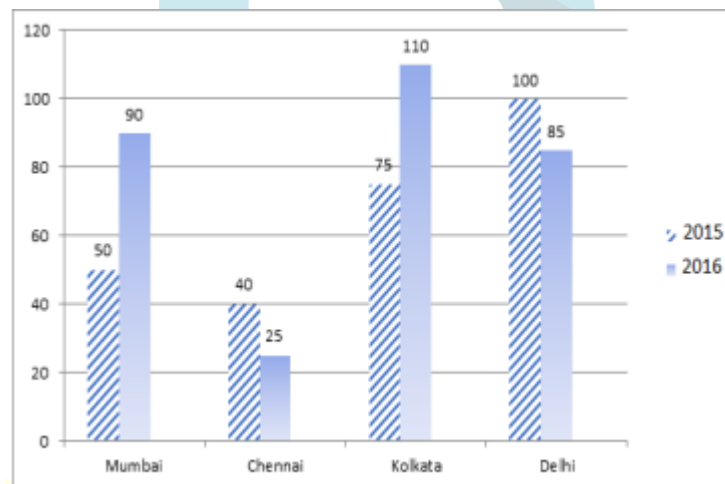
42. Find the value of  $\frac{\cos 2A}{\tan 2A}$  ?

- A.  $\cot 2A$
- B.  $\operatorname{cosec} 2A - \sin 2A$
- C.  $\sin 2A$
- D.  $\operatorname{cosec} 2A$

43. Find the units place of  $3\,555 \times 8\,555 + 8\,333 \times 5\,333$

- A. 4
- B. 6
- C. 2
- D. 5

**Direction (Q44-47):** The given bar chart shows the sales of books (in thousands) in four metro branches of a company for the years 2015 and 2016



44. In the given bar-chart, which branch has the highest increase (in %) in 2016 as compared to 2015?

- A. Delhi
- B. Chennai
- C. Kolkata
- D. Mumbai

45. In the given bar-chart, calculate the percentage increment of sales between the year 2015 and 2016 (round off to one decimal)

- A. 17%
- B. 17.1%



- C. 17.2%
- D. 16.9%

46. In the given bar-chart, the ratio of total sales between Mumbai and Delhi is

- A. 26 : 33
- B. 24 : 37
- C. 28 : 33
- D. 28 : 37

47. In the given bar chart, which branch has the maximum decrease (in%) in 2016 as compared to 2015? (a) Mumbai (b) Chennai (c) Delhi (d) Kolkata  
48. A Certain sum of money becomes five times of itself in 20 years at simple interest. In how many years, will it become 9 times?

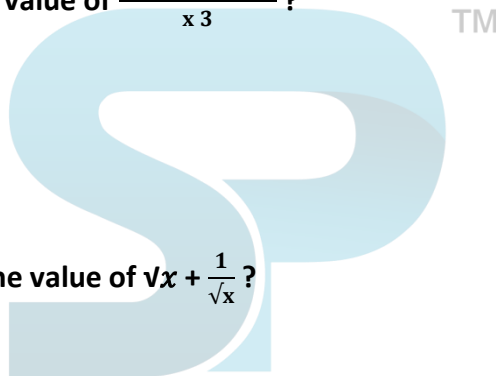
- A. 20 years
- B. 30 years
- C. 40 years
- D. 50 years

49. If  $x = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ , then what is the value of  $\frac{x^5+x^4+x^2+x}{x^3}$  ?

- A. (a)100
- B. (b)104
- C. (c)108
- D. (d)112

50. If  $x = 7 - 2\sqrt{12}$ , then what is the value of  $\sqrt{x} + \frac{1}{\sqrt{x}}$  ?

- A.  $4\sqrt{3}$
- B.  $2\sqrt{3}$
- C. 4
- D.  $4\sqrt{2}$





## Answer and Explanation

1. **Answer:** B

**Explanation:**

	MP	SP
8%	100	92
	100	78
22%	<u>10000</u>	<u>7176</u>

Or 1250: 897

897 units' → 2691

1 unit → 3

1250 unit's →  $1250 \times 3 = 3750$

2. **Answer:** C

**Explanation:**

$$\text{Required time} = \frac{\text{difference in speed}}{\text{speed without stopages}} = \frac{75-50}{75} = \frac{1}{3}$$

$$\text{Time} = \frac{1}{3} \times 60 = 20 \text{ min/hr}$$

3. **Answer:** A

**Explanation:**

$$x + \frac{1}{x} = a$$

$$x^3 + \frac{1}{x^3} = a^3 - 3a$$

$$= 343 - 21 = 322$$

4. **Answer:** D

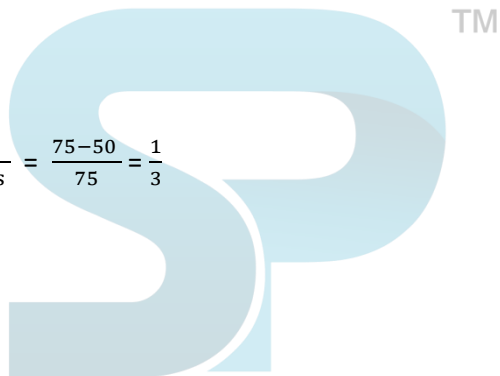
**Explanation:**

A B C

2 4 3

Total work =  $(2 + 4 + 3) \times 8 = 72$  units

$$\text{Required time} = \frac{72}{3} \times \frac{3}{4} = 18 \text{ days}$$





5. Answer: B

Explanation:

$$\cot \theta = \frac{B}{P} = \frac{4}{3}$$

$$H = 5$$

$$\text{Now } \frac{5 \times \frac{3}{5} - 2 \times \frac{4}{5}}{5 \times \frac{3}{5} + 2 \times \frac{4}{5}} = \frac{7}{23}$$

6. Answer: B

Explanation:

$$\operatorname{Cosec} x = \sec (90^\circ - x)$$

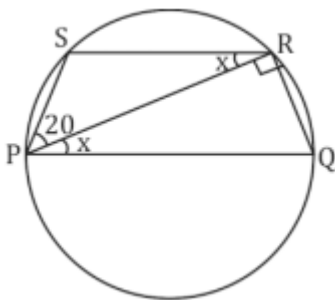
$$\text{So, } 5\theta + (\theta + 18^\circ) = 90^\circ$$

$$6\theta = 72^\circ$$

$$\Rightarrow \theta = 12^\circ$$

7. Answer: D

Explanation:



in cyclic quadrilateral PQRS

$$(20 + x) + (x + 90) = 180$$

$$2x + 110 = 180$$

$$x = 35^\circ$$

8. Answer: B

Explanation:

$$\sin^2 43^\circ + \sin^2 47^\circ = 1$$



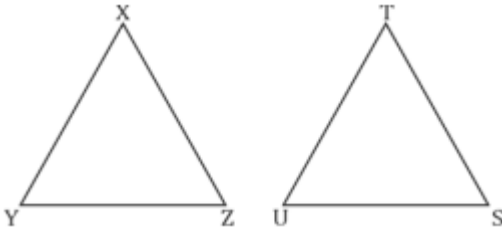
As  $\sin^2 47^\circ = \cos^2 43^\circ$

So,  $1 + \left(\frac{1}{2}\right)^2 - \left(\frac{1}{\sqrt{2}}\right)^2$

$\Rightarrow 1 + \frac{1}{4} - \frac{1}{2} = \frac{3}{4}$

9. Answer: A

Explanation:



$$\frac{\text{ar}(\Delta XYZ)}{\text{ar}(\Delta TUS)} = \left(\frac{YZ}{US}\right)^2$$

$\Rightarrow \frac{25}{16} = \left(\frac{10}{US}\right)^2 \Rightarrow US = 8\text{cm}$

10. Answer: D

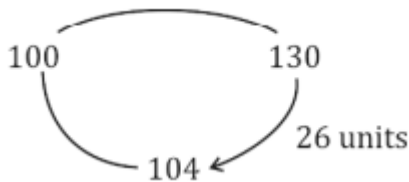
Explanation:



	Old	New
Diameter	5	4
Volume	125	64
Decrease in volume	$= \frac{61}{125} \times 100 = 48.8\%$	

11. Answer: A

Explanation:



Decrease in consumption =  $\frac{26}{130} \times 100\%$

= 20%

12. Answer: B

Explanation:





Volumes would be equal.  $a^3 = b^3 + b^3$

$$a^3 = 2b^3$$

$$\frac{a}{b} = \frac{(2)^{\frac{1}{3}}}{1}$$

13. Answer: c

Explanation:

$$\pi r l = 462$$

$$\frac{22}{7} \times r \times 35 = 462$$

$$r = 4.2 \text{ cm}$$

14. Answer: B

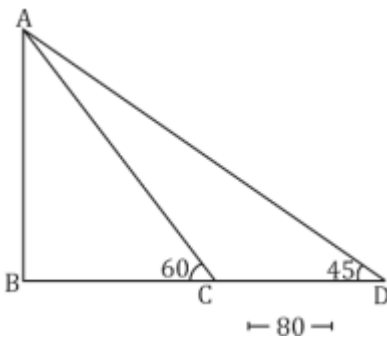
Explanation:

$$\sin^3 A + \cos^3 A = (\sin A + \cos A)(\sin^2 A + \cos^2 A - \sin A \cos A)$$

$$= (\sin A + \cos A)(1 - \sin A \cos A)$$

15. Answer:

Explanation:



$$\sqrt{3} - 1 \text{ unit} \rightarrow 80 \text{ m}$$

$$\sqrt{3} \text{ unit} \rightarrow \sqrt{3} \sqrt{3} - 1 \times 80$$

$$= 40(3 + \sqrt{3}) \text{ m}$$

16. Answer: B

Explanation:

$$\text{HCF} \times a \times b = 1260 - (i)$$

$$\text{HCF} \times a - \text{HCF} \times b = 54 - (ii)$$





(i) ÷ (ii)

$$\frac{a \times b}{a - b} = 1260 \quad 54 \frac{1260}{54} = \frac{70}{3}$$

$$a = 10, b = 7$$

by -(i)

$$\text{HCF} \times 10 \times 7 = 1260 \quad \text{HCF} = 18$$

Numbers are = 18a and 18b = 180 and 126

Sum of numbers = 306

17. **Answer:** B

**Explanation:**

$$\frac{700}{5} = \frac{140}{5} = \frac{28}{5} = \frac{5}{5} = 1$$

No. of zeros = 140 + 28 + 5 + 1

= 174 zeros

18. **Answer:** B

**Explanation:**

$$50\% \text{ profit} = \frac{7}{2} \times 5600$$

= 19600

Whole profit = 39200

19. **Answer:** C

**Explanation:**

$$p^3 + q^3 = (p + q) [(p + q)^2 - 3pq]$$

$$= 5[(5)^2 - 3(3)] =$$

$$5[16] = 80$$

20. **Answer:** B

**Explanation:**

$$\text{Difference in 2 years} = \frac{ab}{100}$$

i.e. 0.49 → Rs.





98 1 unit → Rs. 200

100 units' → 20,000

21. **Answer:** D

**Explanation:**

Total work =  $(4 + 5 + 3) \times 10$

= 120

Required time =  $\frac{120}{3} \times \frac{30}{100} = 12$  days

22. **Answer:** D

**Explanation:**

In 'D' department the no. of employees are lowest.

23. **Answer:** D

**Explanation:**

Required ratio = 200: 350 4: 7

24. **Answer:** B

**Explanation:**

Required % =  $\frac{350 - 200}{200} \times 100 = 75\%$



25. **Answer:** B

**Explanation:**

Compensation of an employee of dept. 'A' = Rs 40,000

So, total compensation =  $40,000 \times 200$

= Rs 80, 00,000 or Rs. 80 lakh

26. **Answer:** D

**Explanation:**

For an equilateral triangle Median = Altitude

$h = 12\sqrt{3}$

$\frac{\sqrt{3}}{2} a = 12\sqrt{3}$



$$a = 24 \text{ cm Area of equilateral triangle } \frac{\sqrt{3}}{4} a^2 = \frac{\sqrt{3}}{4} \times 24 \times 24$$

$$= 144 \sqrt{3} \text{ cm}^2$$

27. **Answer:** B

**Explanation:**

In  $\frac{\Delta A}{FG}$ , D & E are mid-points of AF & AG

$$\frac{AD}{AF} = \frac{AE}{AG} = \frac{1}{2}$$

also,

$$\Delta ADE \sim \Delta AFG \quad \frac{AD}{AF} = \frac{DE}{FG} = \frac{1}{2}$$

$$\Rightarrow FG = 2DE$$

$$\Rightarrow FG = 2 \times 3.2 = 6.4 \text{ cm Similarly,}$$

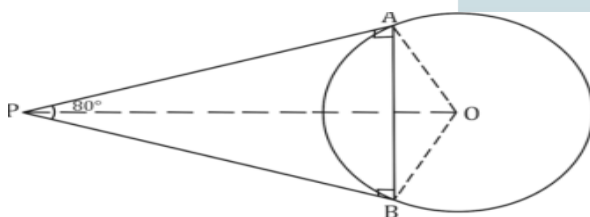
F and G are mid points of AB & AC respectively.

$$\Rightarrow \Delta AFG \sim \Delta ABC$$

$$\frac{AF}{AB} = \frac{EG}{BC} = \frac{1}{2}$$

$$\Rightarrow BC = 2FG = 2 \times 6.4 \text{ cm}$$

$$BC = 12.8 \text{ cm}$$



28. **Answer:** A

**Explanation:**

We know,  $\angle APB + \angle AOB = 180^\circ$

$$\Rightarrow \angle AOB = 180^\circ - 80^\circ = 100^\circ$$

In  $\Delta OAB$

$$\angle OAB = \angle OBA$$

( $\because$   $OA = OB =$  radius of circle)



$$\Rightarrow \angle OAB = \frac{180 - \angle AOB}{2} = \frac{180 - 100}{2} = 40$$

29. Answer: D

Explanation:

Profit on selling 12 bicycles = Rs (12 × 516)

Loss on selling 3 bicycles = Rs (3 × 129)

Total profit on selling 15 bicycles

$$= 12 \times 516 - 3 \times 129 = 6192 - 387$$

$$= \text{Rs } 5805$$

Profit % on all bicycles = 30%

30% of (cost of 15 bicycles) = Rs 5805

$$\Rightarrow \text{Cost price of each bicycle} = \frac{5805}{30 \times 15} \times 100$$

$$= \text{Rs } 1290$$

30. Answer: A

Explanation:

Price of one mobile cover = Rs 284

Selling price of 1 mobile cover after discount of 12%

$$= 284 \times \frac{88}{100} = \text{Rs } 249.70 \text{ Now,}$$

Selling price of 6 mobile covers = 249.70 × 6

$$= \text{Rs } 1498.2$$

31. Answer: B

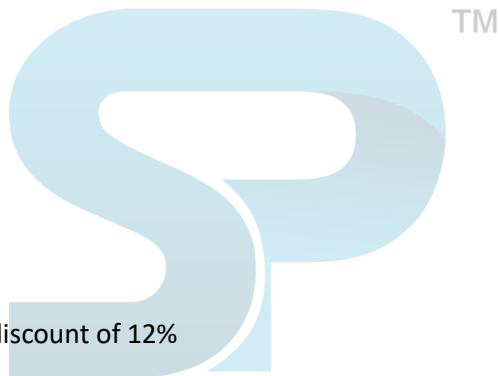
Explanation:

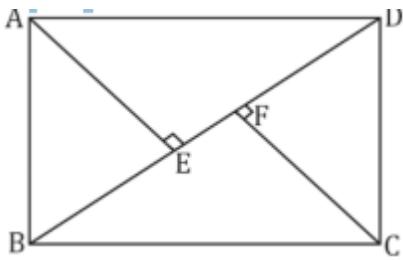
ATQ, A = 3B and B = 2C

$$\Rightarrow A : B : C = 6 : 2 : 1$$

∴ Time taken by A and C to complete the work

$$= \frac{20 \times 2}{(6+1)} = \frac{40}{7} = 5 \frac{5}{7} \text{ days}$$





32. Answer: D

Explanation:

$$BD = 50 \text{ cm}$$

$$AE + CF = 17.3 \text{ cm}$$

Ara of quadrilateral = Ar ( $\Delta ABD$ ) + Ar( $\Delta CBD$ )

$$= \frac{1}{2} \times AE \times BD + \frac{1}{2} \times CF \times BD$$

$$= \frac{1}{2} \times BD \times (AE + CF)$$

$$= \frac{1}{2} \times 50 \times 17.3 = 432.5 \text{ cm}^2$$

33. Answer: B

Explanation:

$$a^3 - b^3 = (a-b)(a^2 + b^2 + ab)$$

$$\Rightarrow 8 \times (a^2 + b^2 + ab) = 496$$

$$\Rightarrow a^2 + b^2 + ab = 62$$

$$\Rightarrow (a+b)^2 - ab = 62$$

34. (d); Speed of boat in still water = 8 km/h

let speed of the stream = x km/h

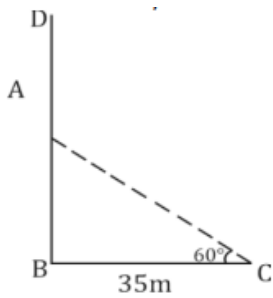
$$\therefore \text{ATQ, } \frac{8+x}{8-x} = \frac{1}{4}$$

$$\Rightarrow 8 + x = 32 - 4x$$

$$\Rightarrow 5x = 24$$

$$\Rightarrow x = 4.8 \text{ km/h}$$





35. Answer: D

Explanation:

$$\text{In } \triangle ABC \cos 60^\circ = \frac{BC}{AC}$$

$$\Rightarrow AC = 70 \text{ cm and } \tan 60^\circ = \frac{AB}{BC}$$

$$\Rightarrow AB = 35\sqrt{3} = 35 \times 1.73 = 60.55 \text{ cm}$$

Total height of the tree = AB + AC

$$= 60.55 + 70 = 130.55 \text{ cm}$$

36. Answer: C

Explanation:

Total value of all coins = Rs 110

Ratio of 50 paisa, 25 paisa & Rs 1 coins = 5 : 8 : 1

$$\frac{5x}{2} + \frac{8x}{4} + x = 110$$

$$5.5x = 110 \Rightarrow x = 20$$

No. of 25 paisa coins =  $8 \times 20 = 160$

37. Answer: A

Explanation:

$$\text{Rate of interest} = 6 + 6 + 6 \times \frac{6 \times 6}{100}$$

$$= 12.36\%$$

Let the sum of money be Rs x

$$\therefore \text{atq, } x \times \frac{12.36}{100} = \text{Rs } 1854$$

$$\Rightarrow x = \text{Rs } 15,000$$





38. Answer: A

Explanation:

We have,  $(2x - 5)^3 + (x - 6)^3 + (x - 13)^3 = 2(2x - 5)(x - 6)(x - 13)$

→ compare it with identity  $a^3 + b^3 + c^3 = 3abc$

We know that it is possible only when,

$$a + b + c = 0$$

$$\Rightarrow (2x - 5) + (x - 6) + (x - 13) = 0$$

$$\Rightarrow 4x = 24 \Rightarrow x = 6$$

39. Answer: B

Explanation:

$$7 - \{16 - (-10 \times 8 - 4)\} = 7 - \{16 - 20\} = 7 + 4 = 11$$

40. Answer: D

Explanation:

External dimensions of base are  $100 \text{ cm} \times 85 \text{ cm} \times 60 \text{ cm}$

Thickness = 2.5 cm Internal dimensions of base w/o wood

$$= (100 - 5), (85 - 5), (60 - 5)$$

$$= 95 \text{ cm}, 80 \text{ cm},$$

55 cm Required volume of wood

$$= (100 \times 85 \times 60) - (95 \times 80 \times 55)$$

$$= 510,000 - 418,000 = 92,000 \text{ cm}^3$$

41. Answer: B

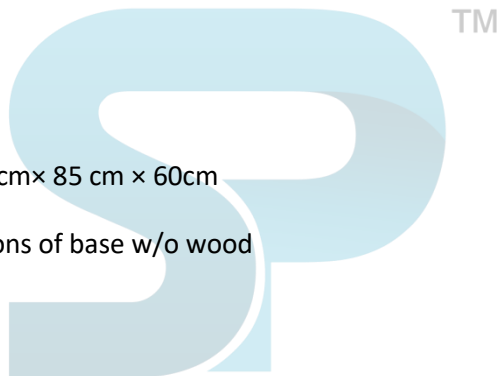
Explanation:

$$\cos 15^\circ - \sin 45^\circ = \cos (45^\circ - 30^\circ) - \sin 45^\circ$$

$$= \cos 45^\circ - \cos 30^\circ + \sin 45^\circ \cdot \sin 30^\circ - \frac{1}{\sqrt{2}}$$

$$= \frac{1}{\sqrt{2}} \times \frac{\sqrt{3}}{2} + \frac{1}{\sqrt{2}} \times \frac{1}{2} - \frac{1}{\sqrt{2}}$$

$$= \frac{\sqrt{3} + 1}{2\sqrt{2}} - \frac{1}{\sqrt{2}} = \frac{\sqrt{3} - 1}{2\sqrt{2}}$$







42. Answer: B

Explanation:

$$\frac{\cos 2A}{\tan 2A} = \frac{\cos^2 2A}{\sin 2A} = \frac{1 - \sin^2 2A}{\sin 2A}$$

$$= \operatorname{cosec} 2A - \sin 2A$$

43. Answer: A

Explanation:

unit place of 3555 = 7

unit place of 8555 = 2

unit place of 8333 = 8

unit place of 5333 = 5

$$\therefore \text{Required unit place} = 7 \times 2 + 8 \times 5 = 14 + 40 = 54$$

44. Answer: D

Explanation:

$$\text{Mumbai} = 90 - 50 \quad 50 \times 100 = 80\%$$

$$\text{Kolkata} = 110 - 75 \quad 75 \times 100 = 50\%$$

Delhi and Chennai has decrease in sale of books

$\therefore$  Mumbai, branches highest increase in sale in 2016 as compared to 2015.

45. Answer: D

Explanation:

Total sale of books in 2015

$$= 50 + 40 + 75 + 100 = 265 \times 1000$$

Total sale of books in 2016

$$= 90 + 25 + 110 + 85 = 310 \times 1000$$

$$\% \text{ age increment in sales} = \frac{310000 - 265000}{265000} \times 100$$

$$= 16.98\%$$

$$\approx 17\%$$

46. Answer: D





Explanation:

$$\text{Required Ratio} = \frac{50+90}{100+85} = \frac{140}{185} = \frac{28}{37}$$

47. Answer: B

Explanation:

$$\text{Chennai} = \frac{40-25}{40} \times 100 = 37\%$$

$$\text{Delhi} = \frac{100-85}{100} \times 100 = 15\% \therefore \text{Chennai has the max decrease}$$

48. Answer: C

Explanation:

$$\frac{p \times r \times 20}{100} = 4p \Rightarrow r = 20\% \text{ Then,}$$

$$\frac{p \times r \times t}{100} = 8p \Rightarrow t = 40 \text{ year}$$

49. Answer: C

Explanation:

$$x = (\sqrt{3}+\sqrt{2})(\sqrt{3}+\sqrt{2})(\sqrt{3}-\sqrt{2})(\sqrt{3}+\sqrt{2}) = 5 + 2\sqrt{6}$$

$$\text{And } 1/x = 5 - 2\sqrt{6} \therefore x + \frac{1}{x} = 10$$

$$x^2 + \frac{1}{x^2} = 98$$

$$\text{Hence, } x^5 + x^4 + x^2 + x x^3 \frac{5+x^4+x^2+x}{x^3} = x^2 + 1 x^2 + x + 1 x = 98 + 10$$

$$= 108$$

50. Answer: C

Explanation:

$$x = 7 - 2\sqrt{12}$$

$$\sqrt{x} = \{(\sqrt{3})^2 + (\sqrt{4})^2 - 2 \times \sqrt{3} \times \sqrt{4}\} \frac{1}{2} = 2 - \sqrt{3}$$

$$\text{And } \frac{1}{x} = \frac{1}{2-\sqrt{3}} = 2 + \sqrt{3}$$

$$\therefore \sqrt{x} + \frac{1}{\sqrt{x}} = 4$$

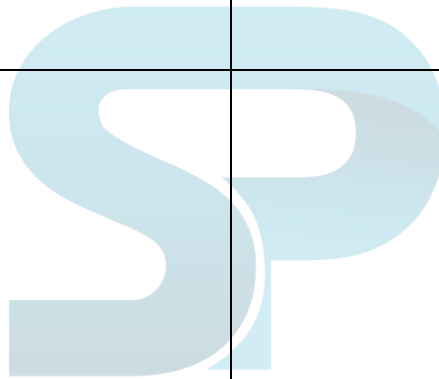




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