

FAST-NU Entry Test 2026 Basic

Mathematics Test # 02 with Solution

Q1) Which one of the following lies between $\frac{3}{7}$ and $\frac{5}{9}$?

- ✓ a) $\frac{9}{17}$ ✓
- b) $\frac{2}{3}$
- c) $\frac{11}{16}$
- d) $\frac{3}{8}$

Handwritten work for Q1:

Options: (a) $\frac{9}{17}$, (b) $\frac{2}{3}$, (c) $\frac{11}{16}$, (d) $\frac{3}{8}$

Comparisons shown:

- $\frac{3}{7} < \frac{9}{17} < \frac{5}{9}$ (Correct)
- $\frac{2}{3} > \frac{5}{9}$
- $\frac{11}{16} > \frac{5}{9}$
- $\frac{3}{8} < \frac{3}{7}$

Other calculations: $\frac{17}{85}$, $\frac{15}{9}$, $\frac{14}{2}$

Q2) The areas of two square fields are 420.25 sq. m and 421 sq. m respectively. The ratio of their sides is:

- ✗ a) None of these ✓
- b) 41 : 42
- c) 20 : 21
- d) 40 : 41
- e) 40 : 42

Handwritten work for Q2:

Area of square = s^2

For 420.25: $s = \sqrt{420.25} = 20.5$

For 421: $s = \sqrt{421} = 21$

Ratio of sides: $20.5 : 21$

Multiplying by 2: $41 : 42$ (Correct)

Other calculations: $(20)^2 = 400$, $(21)^2 = 441$, $20 + \frac{1}{2} = 20.5$, $41 \frac{1}{2}$

Q3) The sides of a rectangular field are in the ratio 2 : 1 and the area of the field is 2 hectares. What is the longer side?

- (a) 200 m
- b) 100 m
- c) 250 m
- d) 400 m

Handwritten work for Q3:

1 Hec = 10,000 m²

2 Hec = 20,000 m²

Ratio 2:1, Area = 20,000 m²

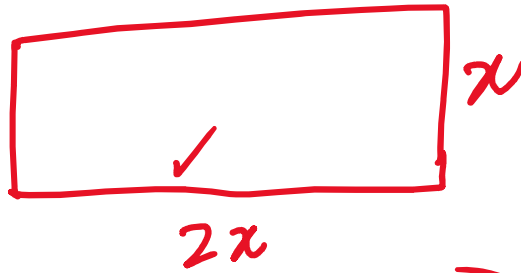
Longer side = $(10000)^{1/2} = 100$ m (Correct)

$$2\text{sec} = 20,000\text{m}^2$$

$$(10^4)^{1/2}$$

$$2x^2 = 20,000\text{m}^2$$

$$x^2 = 10,000\text{m}^2$$

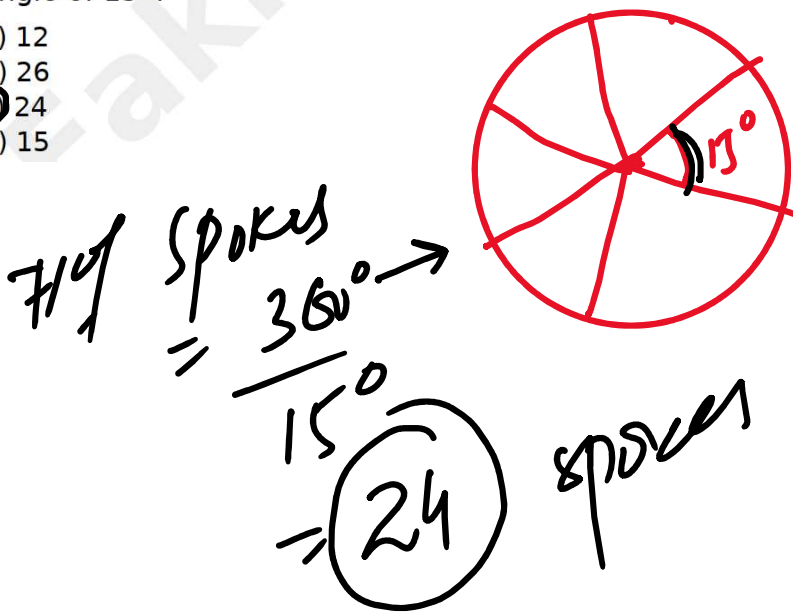


$$\sqrt{x^2} = \sqrt{10^4} = 10^2 = 100\text{m} = x$$

$$2x = 200\text{m}$$

Q4) How many spokes are there in a wheel of a sports car if any two adjacent spokes form an angle of 15° ?

- a) 12
- b) 26
- c) 24
- d) 15



Q5) The difference between compound interest and simple interest on Rs. 1250 for 2 years at 8% is:

- a) Rs. 4
- b) Rs. 8
- c) Rs. 6
- d) Rs. 2

$$(CI) - (SI) \quad \uparrow$$

$$P = 1250$$

$$r = 8\% \quad \left\{ = \frac{8}{100} \right.$$

$$R = 8$$

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

$$= 1250 \times \frac{8}{100} \times \frac{8}{100} = 8$$

$$R = 8\% = 1250 \times \left(\frac{8}{100}\right)^2$$

$$\begin{array}{r} 125 \\ 64 \\ \hline 500 \\ 750 \times \\ \hline 8000 \end{array}$$

$$= \frac{1250 \times 64}{100}$$

$$= \frac{80000}{10000} = 8$$

$$S.I = \frac{P \times R \times T}{100} = P \times r \times T \quad \text{Year}$$

$$r = \frac{R}{100}$$

Total Amount / or Accumulated Am

$$A = P + SI$$

$$A = P + \frac{PRT}{100} = P \left(1 + \frac{RT}{100}\right)$$

$$\boxed{A = P(1 + RT)}$$

Comp. Interest

$$\boxed{A = P \left(1 + \frac{R}{100} \right)^T}$$

TD or
Account $\rightarrow$

$$\boxed{A = P(1 + R)^T}$$

$$\boxed{CI = A - P}$$

$$CI = P \left(1 + \frac{R}{100} \right)^T - P$$

$$\boxed{CI = P \left[\left(1 + \frac{R}{100} \right)^T - 1 \right]}$$

* If interest is compounded is

* If interest is

times per yr

$$A = P \left(1 + \frac{R}{100} \right)^{nT}$$

~~~~~

Q6) The difference in simple interest on a certain sum of money for 3 years and 2 years at 15% per annum is Rs. 675. The sum of money is:

- a) Rs. 4300
- b) Rs. 3600
- c) Rs. 4500
- d) Rs. 4360

$$15\% = 675 \checkmark$$

$$1\% = \frac{675}{15} = 45$$

$$100\% = \textcircled{4500} \rightarrow P$$

$$15\% \text{ of } P = 675$$

$$\frac{15}{100} \times P = 675$$

$$P = \frac{675 \times 100}{15}$$

Oh → Double

... A!

lb → pound

Cu: Al

Q7) Aluminum bronze consists of copper and aluminum, usually in the ratio of 10 : 1 by weight. If an object made of this alloy weighs 77 lb, how many pounds of aluminum does it contain?

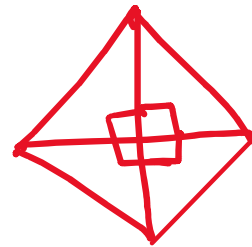
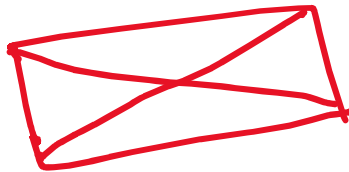
- a) 7.7
- b) 7.0
- c) 7.2
- d) 70.7

total parts =  $10 + 1 = 11$

Al (weight) =  $\frac{1}{11} \times 77 \text{ lb}$   
 $= 7 \text{ lb}$

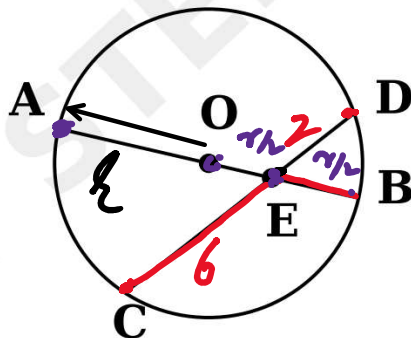
Q8) Diagonals of a quadrilateral are equal but not perpendicular to each other. It must be a:

- a) Parallelogram
- b) Rectangle
- c) Square
- d) Rhombus



Q9) AB is a diameter of the circle with centre O. CD cuts AB at E such that OE = EB. If CE = 6 cm and ED = 2 cm, then the radius of the circle is:

- a)  $4\sqrt{3}$  cm
- b) 6 cm
- c) 8 cm
- d) 4 cm



$r = ?$

$OB = r$

$OE = EB = \frac{r}{2}$

$AE \times EB = CE \times ED$

$(AO + OE) \times \frac{r}{2} = 6 \times 2$

$$(A+OE) \times \frac{1}{2} = 0 \times 1 = 0$$

$$\left(1 + \frac{x}{2}\right) \times \frac{x}{2} = 12$$

$$\frac{3x}{2} \times \frac{x}{2} = 12$$

$$\frac{3x^2}{4} = 12 \Rightarrow 3x^2 = 48$$

$$x^2 = 16$$

$$x = 4$$

Q10)  $(\sqrt{98/7}) \times (3/\sqrt{12}) \times (\sqrt{72/6}) = ?$

a)  $\sqrt{2}$

b)  $\sqrt{8}$

c)  $\sqrt{3}$

d)  $1/\sqrt{8}$

$$= \frac{\cancel{7}\sqrt{2}}{\cancel{7}} \times \frac{3}{2\sqrt{3}} \times \frac{\cancel{6}\sqrt{2}}{\cancel{6}}$$

$$= \frac{3}{\sqrt{3}} = \sqrt{3}$$

$$= \frac{3^{1/2}}{3^{1/2}} = 1$$

$$\begin{array}{r} 2 \overline{) 98} \\ 7 \overline{) 49} \\ 7 \end{array}$$

$$\sqrt{98} = \sqrt{7^2 \times 2}$$

$$\sqrt{12} = \sqrt{4 \times 3}$$

$$72 \sqrt{2 \times 2} = 72 \times 2 = 144$$

$$(52)^2 = 2704$$

$$3^{12} \\ \frac{3}{3} \times \frac{3}{3} = \frac{3 \times 3}{3} = 3$$

Q11) A man plants 49284 apple trees in his garden and arranges them so that there are as many rows as there are apple trees in each row. The number of rows is:

- a) 182  
b) 122  
c) 202  
d) 222

$R_1 \rightarrow$   
 $R_2$   
 $R_3$   
 $R_4$

$$\sqrt{n^2} = \sqrt{49284}$$

$$n = 222$$

$2 \overline{) 49284}$   
 $42 \overline{) 9284}$

Q12) The number 108 is 45 percent of what number?

- a) 265  
b) 236  
c) 235  
d) 48.6  
e) 240

$108 = \frac{45}{100} \times x$

$\frac{12}{9} \div \frac{1}{108}$

$x = \frac{108}{45} \times \frac{100}{100}$

108

45(9)

(240)

=

$$B \cap (A')' = B \cap A$$

Q13)  $B - A'$  is equal to:

a)  $A \cap B$

b)  $A - B$

☒ c)  $B \cap A$  ✓

d)  $B \cup A$

$$A \cap B = B \cap A$$

$$\left. \begin{array}{l} X - Y \\ \\ X - Y' \\ \\ X \cap Y \end{array} \right\} = X \cap Y'$$

Alligation cross method

Q14) In what proportion must a grocer mix rice at Rs. 1.20 per kg and Rs. 1.44 per kg, so as to make a mixture worth Rs. 1.26 per kg?

a) 2 : 5

☒ b) 3 : 1

c) 4 : 2

d) 4 : 3

e) 3 : 4

Cheaper

1.20

Dearer

1.44

1.26

0.06

0.18

0.18 : 0.06

18 : 6

(3 : 1)

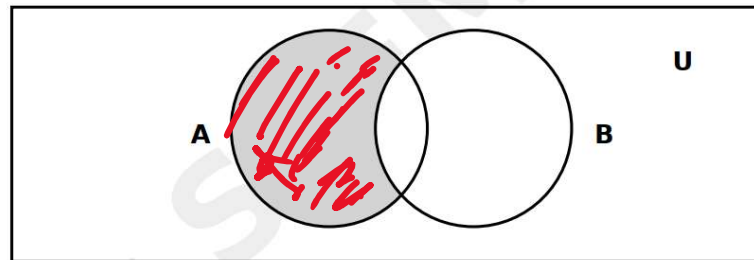
44  
26  
18

(X/W)

3 : 1  
 Cheap Rice → Dearest Rice

Q15) The shaded region in the adjoining diagram represents:

$$A^c = U - A$$



- a)  $A^c$
- b)  $A - B$
- c)  $B^c$
- d)  $B - A$

$$A - B$$

Q16)  $11 \frac{1}{3} + 3 \frac{1}{2} + 2 \frac{4}{5} = ?$

- a)  $12 \frac{1}{3}$
- b)  $16 \frac{1}{2}$
- c)  $17 \frac{1}{9}$
- d)  $17 \frac{19}{30}$

$$17 \frac{19}{30}$$

$$11 \frac{1}{3} + 3 \frac{1}{2} + 2 \frac{4}{5}$$

$$= 11 + \frac{1}{3} + 3 + \frac{1}{2} + 2 + \frac{4}{5}$$

$$= 16 + \frac{1}{3} + \frac{1}{2} + \frac{4}{5}$$

$$= 16 + \frac{10}{30} + \frac{15}{30} + \frac{24}{30}$$

$$= 16 + \frac{49}{30}$$

11

✓

①

$$30 \overline{) 49} \begin{array}{r} 1 \\ 30 \\ \hline 19 \end{array} = \frac{16 + 1 + \frac{19}{30}}{30} = \frac{17}{30}$$

$= 16 + \frac{19}{30}$

Q17) If  $x^2 + 1 = 0$ , then the value of  $x$  is:

- a) 2
- b) 0
- c)  $\pm 2$
- d) None of these
- e) 1

$$\sqrt{x^2} = -1 \sqrt{1^2}$$

$$x = \pm \underline{\underline{i}}$$

Q18) A man spends Rs. 230.50 on average during the first eight months. During the next 4 months, he spends Rs. 180.00 on average. He took a loan of Rs. 164.00 during the year. Find his average monthly income for the year:

- a) 200
- b) 400
- c) 180
- d) 250

$$\text{Avg. Monthly Inc.} = \frac{\text{Total Income}}{12}$$

$$\text{Total Expenses} = \text{Total Income} + \text{Total Loan}$$

$$\text{Avg} = \frac{\text{Total Sum}}{\text{no. of months}}$$

$$\text{Avg} = \frac{\text{no. of marks}}{\text{Total Expenses of 8 marks}}$$

$$237.50 = \frac{\text{Total Expenses of 8 marks}}{8}$$

$$\begin{array}{r} 461 \\ 237.5 \times 8 \\ \hline 1900 \end{array}$$

$$461 \times 4$$

$$1844$$

$$S_8 = 1844$$

$$S_4 = 180 \times 4$$

$$S_4 = 720$$

$$\begin{array}{r} 1844 \\ 720 \\ \hline \end{array}$$

$$2564$$

$$\text{Total Expenses} = 2564$$

$$(2) \Rightarrow 2564 = \text{Total Income} + 164$$

$$\text{Total Income} = 2400$$

$$\text{①} \Rightarrow \text{Avg. Monthly} = \frac{2400}{12} = 200$$

Q19) If A has m elements and B has n elements, then  $A \times B$  has how many elements?

- ☒ a)  $m \times n$  ✓
- b)  $2n$
- c)  $m - n$
- d)  $m + n$

$A \times B = \{ (a_1, b_1), (a_1, b_2), \dots, (a_m, b_n) \}$  Cartesian Product  
 $m \times n$

Q20) At what percentage per annum will the simple interest on a sum of money be  $\frac{2}{5}$  of the amount in 10 years?

- ☒ a) 4% ✓
- b) 1%
- c) 3%
- d) 2%

T R=?

SI

$P$

$$SI = \frac{2}{5}P$$

$$SI = \frac{PRT}{100}$$

$$\frac{2}{5}P = \frac{P \times R \times 10}{100}$$

$$R = \frac{20}{5} = 4\%$$

Q21) The difference in simple interest at 12% per annum on a certain sum for 2 years and 4 years is Rs. 864. The sum is:

- a) Rs. 3400
- b) Rs. 3600
- c) Rs. 2750
- d) Rs. 2500



$$SI = \frac{PRT}{100}$$

$$864 = \frac{P \times 12 \times 2}{100}$$

$$P = \frac{864 \times 100}{2 \times 12}$$

$$P = 3600$$

$$\begin{array}{r} 36 \\ 24 \overline{) 864} \\ \underline{72} \\ 144 \end{array}$$

$$\begin{array}{r} 24 \\ 6 \overline{) 144} \\ \underline{144} \end{array}$$

$$2x + 4 = 9 + 4 = 13$$

Q22) If  $5x - 3y = 3$  and  $2x - 4y = -10$ , then  $3x + y = ?$

- a) 13
- b) 14
- c) 7
- d) -13

$$x - 2y = -5$$

$$x = 2y - 5 \quad (1)$$

$$10y - 25 = 3y = 3$$

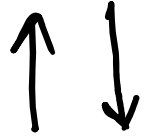
$$7y = 28 \Rightarrow y = 4$$

$$x = 8 - 5 = 3$$

$$n=8 \rightarrow$$

$$n=2$$

$$70 = 28 \neq 0$$



★



Q23) A's salary was reduced by 10%. In order to have his salary back to the original amount, it must be raised by:

- a)  $12 \frac{1}{2}\%$
- b) 11%
- c)  $11 \frac{1}{9}\%$
- d) 10%

$11 \frac{1}{9}\%$  original salary = 100 →

$$\frac{10}{100} \times 100 = 10$$

Reduced sal = 90 Rs

∴ % increase =  $\frac{10}{90} \times 100\%$

$$\begin{array}{r} 11 \\ 9 \overline{) 100} \\ \underline{99} \\ 1 \end{array}$$

$$\frac{100}{9}\%$$

$$= 11 \frac{1}{9}\%$$

$$100 \xrightarrow{-10\%} 100 - 10 = 90$$

$$10\% \times 90$$

$$107 \times 90$$

$$\frac{19}{14} \times 90 = 9$$

$$90 + 9 = 99 \checkmark$$

$$107 \Rightarrow 100 \rightarrow 110$$

$$99$$

$$\frac{14}{14} \times 110 = 11$$

$$99$$

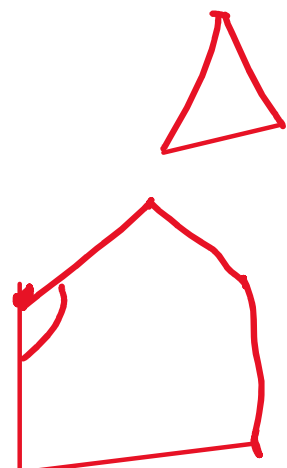
$$110$$

$$110$$

Q24) Each angle of a regular pentagon will be:

- a)  $72^\circ$
- b)  $120^\circ$
- c)  $90^\circ$
- d)  $108^\circ$

$$\text{Interior angle} = \frac{(n-2) \times 180^\circ}{n}$$



$n=5$ 

$$= \frac{3 \times 180}{3 \times 36}$$

Total Interior Ang =  $(n-2) \times 180$

Triangles  $(180)$ 

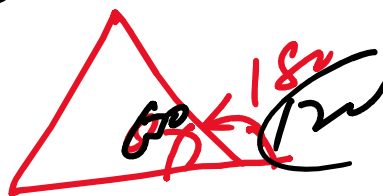
$$= \frac{3 \times 180}{3} = 540$$

$(n-2) \times 180 = 1 \times 180 = 180$

Interior

$$\frac{(n-2) \times 180}{n}$$

$$\frac{1 \times 180}{3} = 60$$



Exterior  $n = 180 - 120$

and Ang of  $180 - 108$

Exterior Ang of  
pentagon =  $180^\circ - 108^\circ$   
=  $72^\circ$

$\frac{360}{3} = 120$

Exterior Ang =  $\frac{360^\circ}{n}$   
Pentagon  $\Rightarrow n = 5$   
=  $\frac{360}{5} = 72^\circ$

Interior Ang of penta =  $180^\circ - 72^\circ$   
=  $108^\circ$

Exterior + Interior Ang =  $180^\circ$

Q25) By solving the inequality  $18 - y > 9$ , the answer will be:

- a)  $y < 9$
- b)  $y < 5$
- c)  $y > 12$
- d)  $y > 9$

$-y > -9$   $9 - 18$

$y < 9$   $\frac{9-18}{1}$   
 $\frac{9-18}{1} = -9$

10th

Q26) If  $a^2 + b^2 + c^2 = 8$  and  $a + b + c = 3$ , then  $ab + bc + ca = ?$

- a)  $1/2$
- b)  $-2/4$
- c)  $4/9$
- d)  $3/5$
- e)  $1/3$

$$(a+b+c)^2 = a^2 + b^2 + c^2 + 2(ab+bc+ca)$$

$$9 = 8 + 2(X)$$

$$1 = 2(X)$$

$$X = \frac{1}{2}$$

9999

Q27) The greatest number of four digits which is divisible by 15, 25, 40 and 75 is:

- a) 9800
- b) 9400
- c) 9000
- d) 9600

$$\text{LCM} = 600$$

LCM

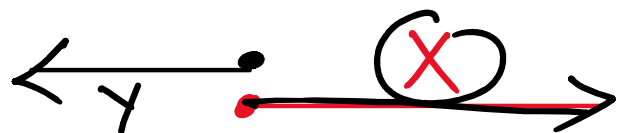
$$\begin{array}{r} 5 \overline{) 15-25-40-75} \\ 5 \overline{) 3-5-8-15} \\ 3 \overline{) 3-4-8-3} \\ 1 \overline{) 1-1-8-5} \end{array}$$

$$\begin{array}{r} 9800 \\ 600 \overline{) 9800} \end{array}$$

$$\begin{array}{r} 9600 \\ 600 \overline{) 9600} \end{array}$$

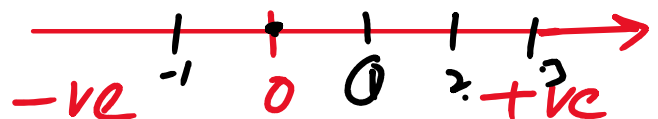
$$\begin{array}{r} 75 \\ 8 \overline{) 75} \\ 60 \end{array}$$

$$16 \times 6 = 96$$



Q28) If  $X \geq 0$  and  $Y \leq 0$ , then:

- a)  $Y \leq X$
- b)  $X \geq Y$
- c) None
- d)  $X < Y$
- e)  $X = Y$





Q29) A man travels 630 km partly by car and partly by bus. It takes 12 hours in all if he travels 180 km by bus and the rest by car. If he travels 120 km by bus and the remaining distance by car, it saves him 30 minutes. Find the speed of the car:

- a) 55 km/hour
- b) 45 km/hour
- c) 60 km/hour
- d) 50 km/hour

$v_c, v_b$

$$S = 630 \text{ km}$$

$v_c$

$$S = vt$$

$$t = \frac{S}{v}$$

Let speed of car =  $C$   
 " " " bus =  $B$



Case 1

Distance covered by

$$S_B = 180 \text{ km}$$

$$S_C = 630 - 180 = 450 \text{ km}$$

$$\text{Time Taken} = 12 \text{ hrs}$$

$v \rightarrow \text{speed}$

$$t_B + t_C = 12$$

$$\frac{180}{v_B} + \frac{450}{v_C} = 12$$

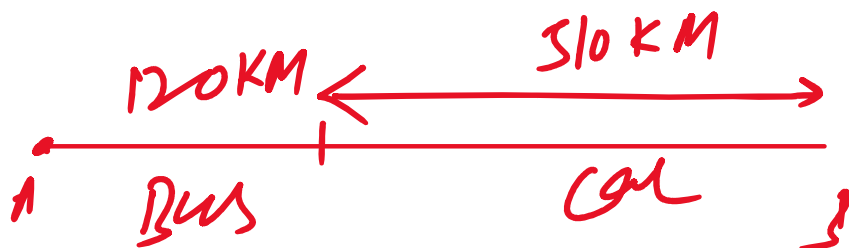
$\div 3 \Rightarrow$

$$\frac{30}{v_B} + \frac{75}{v_C} = 2 \rightarrow \textcircled{1}$$

Case - II  
 $\frac{23}{10} = 2.3$

30 min  
 $= 0.5 \text{ hr}$

$$\frac{23}{10} = 2.3$$



$$t_B + t_C = 11.5$$

$$\frac{120}{v_B} + \frac{510}{v_C} = \frac{23}{2} (11.5)$$

$$\frac{120}{v_B} + \frac{510}{v_C} = 11.5$$

(1) x 4:

$$\frac{120}{v_B} + \frac{300}{v_C} = 8$$

$$\frac{210}{v_C} = \frac{315}{10} = \frac{7}{2}$$

$$v_C = 210 \times 2$$

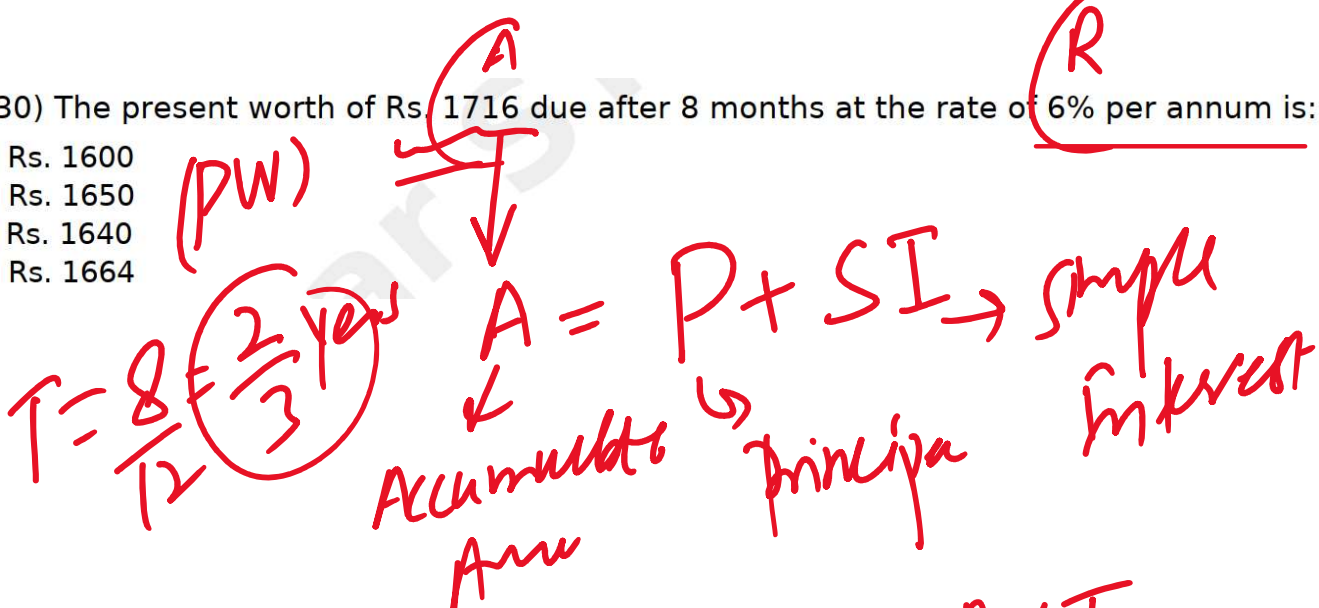
$$v_C = 210 \times 2 = 30 \times 2$$

$$v_C = 60 \text{ km/hr}$$

$$V_L = 60 \text{ km/hr}$$

Q30) The present worth of Rs 1716 due after 8 months at the rate of 6% per annum is:

- a) Rs. 1600
- b) Rs. 1650
- c) Rs. 1640
- d) Rs. 1664



$$T = \frac{8}{12} = \frac{2}{3} \text{ year}$$

$$A = PW + \frac{PW \times R \times T}{100}$$

$$1716 = PW + \frac{PW \times 6 \times \frac{2}{3}}{100}$$

$$1716 = PW + 0.04 PW$$

$$1.04 PW = 1716$$

$$PW = \frac{1716}{1.04} = \frac{1716 \times 100}{104}$$

$$\begin{array}{r}
 16.5 \\
 104 \overline{) 1716} \\
 \underline{104} \phantom{0} \\
 676 \\
 \underline{628} \\
 520 \\
 \underline{520} \\
 0
 \end{array}$$

$$\begin{array}{r}
 1.04 \\
 \hline
 100
 \end{array}$$

$$\begin{array}{r}
 404 \\
 \hline
 100
 \end{array}$$

$$\begin{array}{r}
 16.5 \times 100 \\
 \hline
 1650
 \end{array}$$

Q31) If  $1/r = 3$  and  $s = 3$ , what is  $r$  in terms of  $s$ ?

- a)  $s$
- b)  $-s$
- ☒ c)  $1/s$
- d)  $9s$

$$\frac{1}{r} = \frac{s}{1} \Rightarrow r = \frac{1}{s}$$

Q32) A rectangular tank of 25 cm by 20 cm contains 5 litres of water. What is the height of the water in the tank?

- a) 12 cm
- ☒ b) 10 cm
- c) 8 cm
- d) 15 cm

$$\begin{aligned}
 \text{Vol} &= 5 \text{ Litres} \\
 \text{Vol} &= 5000 \text{ cm}^3 \\
 l \times w \times h &= 5000 \text{ cm}^3 \\
 25 \times 20 \times h &= 5000
 \end{aligned}$$

$$25 \times 20 \times h = 5000$$

$$h = \frac{5000}{25 \times 20} = 10 \text{ cm}$$

set

Q33) A is a set of even numbers and B is a set of prime numbers.  $A \cap B$  is:

- a) Empty set
- ☒ b) {2}
- c) Set of whole numbers
- d) Set of odd numbers
- e) Universal set

$$A = \{0, 2, 4, 6, \dots\}$$

$$B = \{2, 3, 5, 7, 11, \dots\}$$

$$\{2\}$$

$$A \times (B \cap C) \rightarrow \underline{A \times B \cap A \times C}$$

Q34) By expanding  $A = |\sqrt{3} - 7; \sqrt{7} - \sqrt{3}|$ , we get:

- a)  $-4\sqrt{7}$
- b)  $(\sqrt{3})^3 - 7\sqrt{7}$
- ☒ c)  $3 - 7\sqrt{7}$
- d)  $6 - 7\sqrt{7}$
- e)  $9 - 7\sqrt{7}$

$$\left| \sqrt{3} - 7 \right| = 3 - 7\sqrt{7}$$

Q35) If a bicycle is traveling at a speed of 10 km/hour, the time required to cover 400 m is:

- a) 8.9 minutes
- b) 1.3 minutes
- c) 7.6 minutes
- ☒ d) 2.4 minutes
- e) 3.2 minutes

$$t = \frac{s}{v} = \frac{0.4 \text{ km}}{10 \text{ km/h}} = 0.04 \text{ h} = 2.4 \text{ minutes}$$

$$\frac{4.0}{10}$$

$$S = 400 \text{ m} = \frac{4000 \text{ Km}}{1000} = 0.4 \text{ Km}$$

$$~~t = 0.04 \text{ hr}~~ \quad t = 0.04 \text{ hr}$$

$$t = \frac{0.04 \times 60 \text{ min}}{100}$$

$$t = \frac{24}{10} = 2.4 \text{ min}$$

Q36) One angle of a triangle is  $82^\circ$ . The other two angles are in the ratio 2 : 5. Find the number of degrees in the smallest angle of the triangle.

- a) 25
- b) 14
- c) 28
- d) 38

$$82^\circ + 2x + 5x = 180^\circ$$

$$7x = 98$$

$$x = 14^\circ$$

$$2x = 28^\circ$$

$$\begin{array}{r} 180 \\ - 82 \\ \hline 98 \end{array}$$

Q37)  $3.01 \times 0.11 = ?$

- a) 0.3311
- b) 0.0341
- c) 3.311

$$\begin{array}{r} 301 \\ 11 \\ \hline 3311 \end{array}$$

- b) 0.0341  
 X c) 3.311  
 X d) 0.341

$$\begin{array}{r} 301 \\ 301 \times \\ \hline 0.3311 \end{array}$$

4) 2.3  
 5) 2.30  
 6) 2.300  
 d) ~~2.3000~~

$\frac{213}{10}$  ✓

~~$\frac{213}{10}$~~

Q38) If a laser printer can print  $x$  pages per minute, how many minutes, in terms of  $x$ , would it take the laser printer to print a 100-page document?

- a)  $x/100$   
 b)  $100 + x$   
 c)  $100x$   
 ✓ d)  $100/x$   
 e)  $100 - x$

Pages  $\therefore$  Time (minutes)

$x$  ↑  
 100

1 ↑  
 $y$

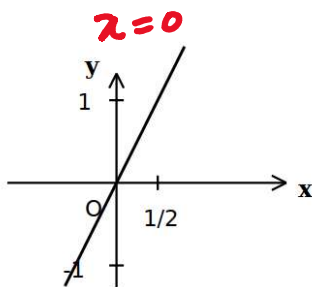
$$\frac{100}{x} = \frac{1}{y} \Rightarrow y = \frac{100}{x}$$

$$\frac{0}{1} = \frac{1}{\sqrt{1}}$$

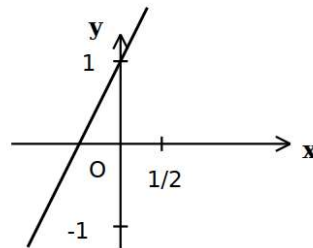
$x$  pages ————— 1 min  
 1 " —————  $\frac{1}{x}$  min  
 100 per —————  $\frac{100}{x}$  min

Q39) Which of the following is the graph of  $y = 2x - 1$ ?  $\rightarrow x=0$

a)

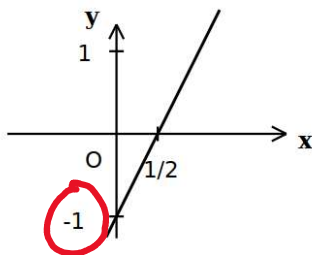


c)

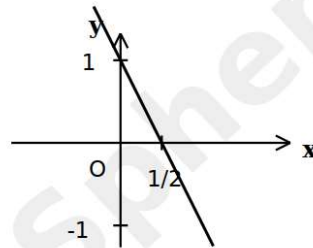


$$y = mx + c$$

b)



d)



Q40) If  $\log_m(P + q)^2 = 1$ , express  $P$  in terms of  $m$  and  $q$ .

- a)  $P = \sqrt{q}$
- b)  $P = -q \pm \sqrt{m}$
- c)  $P = m \pm \sqrt{q}$
- d) None
- e)  $P = m\sqrt{m}$

$$x \cdot 1 = x$$

$$m^0 = 1$$

$$\log_m (P+q)^2 = \frac{1}{m}$$

$$\ln 1 = 0$$

$$\sqrt{(P+q)^2} = \pm \sqrt{m}$$

$$\log_m m = 1$$

$$\left. \begin{aligned} \ln i &= 0 \\ \log_b 1 &= 0 \end{aligned} \right\} \quad \sqrt{(P+Q)} = \pm \sqrt{m} \quad \left\{ \begin{aligned} &\sqrt{m} \\ &\log_m(\pm) \end{aligned} \right.$$

$$P+Q = \pm \sqrt{m}$$

$$P = -Q \pm \sqrt{m}$$

Q41) In an election there were two candidates. A candidate secured 57% of the total votes polled and was elected by a margin of 2100 votes. Find the total number of votes polled.

- a) 21000
- b) 18000
- c) 17500
- d) 15000

$$\text{Margin} = 57\% - 43\% = \underline{2100}$$

$$\text{Margin} = 14\% \text{ of the } \underline{\text{votes}} = 2100$$

$$\frac{14}{100} \times X = 2100$$

$$X = \frac{2100 \times 100}{14}$$

$$X = 15000$$

Q42) If the diameter of a circle increases by 50 percent, by what percent will the area of the circle increase?

- a) 50%
- b) 125%
- c) 100%
- d) 25%

$$A = \pi r^2 = \left\{ \pi \frac{d^2}{4} \right\} \quad \left( r = \frac{D}{2} \right)$$

$$d = 10 \quad d^2 = (100 \rightarrow A)$$

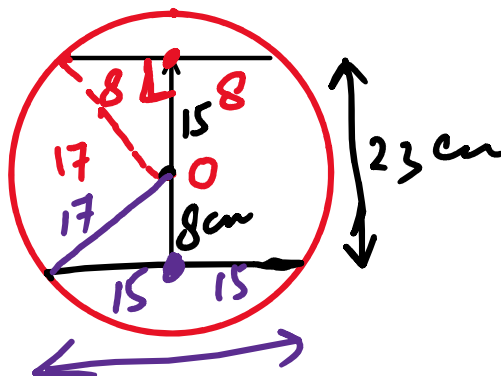
$d_1 = 10$ ,  $d_1^2 = 100 \rightarrow A$   
 $d_2 = 15 \Rightarrow A = 225$   
 $225 - 100 = 125$

Q43) In a circle of radius 17 cm, two parallel chords are drawn on opposite sides of a diameter. The distance between the chords is 23 cm. If the length of one chord is 16 cm, then the length of the other is:

- a) 23 cm
- b) 30 cm
- c) 34 cm
- d) 15 cm

$17, 8, 15$

$3, 4, 5 = 5, 12, 13$   
 $8, 15, 17$



$\sqrt{289 - 64}$

Q44) A sum of money is divided among John, Joshua and Raymond in the ratio 3 : 7 : 11. If Raymond has Rs. 168 more than John, find the sum of money.

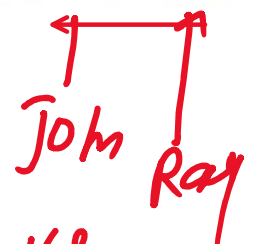
- a) Rs. 680
- b) Rs. 389
- c) Rs. 787
- d) Rs. 441

Total = 21 ✓  
parts

$11 - 3 = 8 \text{ parts} = 8x = 168$

$x = \frac{168}{8} = 21$

Total Money =  $21 \times 21 = 441$



Q45) The total contribution by 3 students to the fund for a hospital was 60. After the 4th student contributed, the average of the 4 became 25. How much did the 4th student contribute?

Q45) The total contribution by 3 students to the fund for a hospital was 60. After the 4th student contributed, the average of the 4 became 25. How much did the 4th student contribute?

- a) 60
- b) 40
- c) 50
- d) 80
- e) 70

$$\text{Avg} = \frac{\text{Total Sum}}{\text{No. of Stu.}} = \frac{60}{3} = 20$$

$$\text{Sum of 3 students} = 60$$

$$\text{Avg} = 25 = \frac{\text{Sum}}{4}$$

$$\text{Sum} = 100$$

$$\text{4th student contr.} = 100 - 60 = 40$$

Q46)  $1111 \div 11 + 101 = ?$

- a) 202
- b) 204
- c) 220
- d) 200

$$101 + 101$$

$$\begin{array}{r} 101 \\ 11 \overline{) 1111} \\ \underline{11} \phantom{11} \\ 11 \phantom{11} \\ \underline{11} \phantom{11} \\ 11 \\ \underline{11} \\ 0 \end{array}$$

$\div, *$

$\div, *$

$$2 \overline{) 202} = 101$$

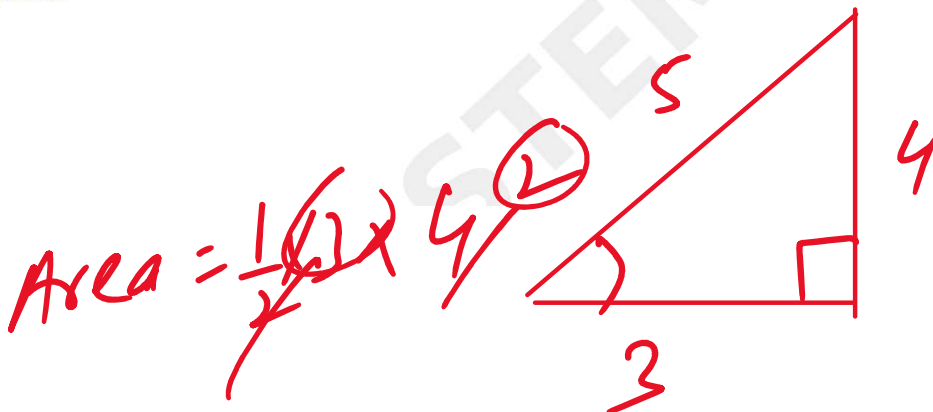
$$2 \overline{) 202} = 101$$

$$2 - \boxed{2/2} + \boxed{2 \times 2} \quad \begin{matrix} 2 \\ \sqrt{2} \\ 2 \end{matrix}$$

$$= 2 - 1 + 4 = 1 + 4 = 5$$
~~$$= 0/2 \quad 0 + 4 = 4 \text{ Wrong}$$~~

Q47) What is the area of a right-angled triangle with hypotenuse of length 5 and base of length 3?

- a) 4
- b) 7
- c) 5
- ☒ d) 6
- e) 3



Q48) If  $\log a = 0.4771$  and  $\log b = 0.3010$ , then  $\log ab =$

- a) 0.5229
- b) 0.6532
- c) 0.6990
- d) 0.1761
- ☒ e) 0.7781

$$\log(ab) = \log a + \log b$$

Q49) A dealer marks his goods 20% above his cost price. If he gives a discount of 10% on his marked price, the profit he earns on his goods is:

Q49) A dealer marks his goods 20% above his cost price. If he gives a discount of 10% on his marked price, the profit he earns on his goods is:

- a) 10
- b) 7
- c) 12
- d) 8

Let  $CP = 100$  ✓

20% of  $CP = 20$  ✓

$MP = 120$  ✓

Discount = 10% of  $MP = \frac{10}{100} \times 120 = 12$  ✓

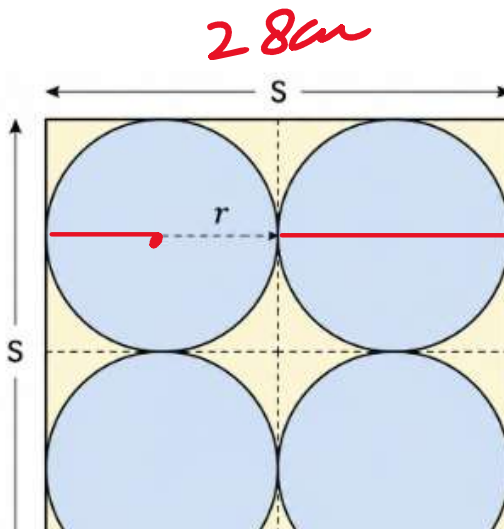
$SP = 120 - 12 = 108$  ✓

Profit =  $SP - CP$   
 $= 108 - 100 = 8\%$  ✓

Q50) Four equal-sized maximum circular plates are cut off from a square paper sheet of area  $784 \text{ cm}^2$ . The circumference of each plate is:

- a) 22 cm
- b) 44 cm
- c) 66 cm
- d) 88 cm

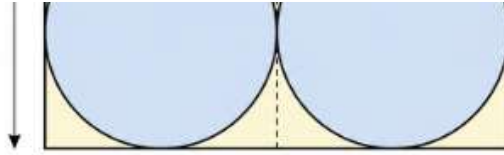
Area =  $784 \text{ cm}^2$   
 $S^2 = 784$   
 $S = 28 \text{ cm}$  ✓



$4r = 28$

$r = 7 \text{ cm}$  ✓

$$S = 28 \text{ cm}$$



$$C = 2\pi r \times \frac{2 \times 22}{7} \times 7$$

Q51) After a reduction of 8% in a water bill, \$300 remains to be paid. Then the original bill to be paid before reduction is:

a) \$362

b) \$355

c) \$326 ✓

d) \$350

92%

$x$

$$92\% \text{ of } x = 300$$

$$\frac{92}{100} \times x = 300$$

$$x = \frac{75 \times 300}{92}$$

$$= \frac{3.26 \times 100}{100} = 3.26$$

$$\begin{array}{r} 23 \overline{) 75.69} \\ \underline{69} \phantom{00} \\ 60 \phantom{00} \\ \underline{60} \phantom{00} \\ 0 \phantom{00} \\ \underline{0} \phantom{00} \\ 0 \phantom{00} \\ \underline{0} \phantom{00} \\ 0 \end{array}$$

$$\begin{array}{r} 23 \overline{) 6} \\ \underline{46} \\ 138 \end{array} \text{ (1)}$$

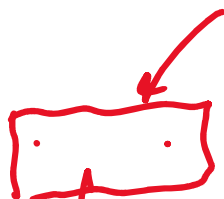
Q52) In a group of 10 people who have salaries ranging from \$75,000 to \$200,000, the salary of the person earning the maximum is increased from \$200,000 to \$225,000. What is true

Q52) In a group of 10 people who have salaries ranging from \$75,000 to \$200,000, the salary of the person earning the maximum is increased from \$200,000 to \$225,000. What is true about the current mean and median as compared to before the salary increase?

- a) The mean increases but the median stays the same.
- b) Cannot be determined
- c) The mean stays the same but the median increases.
- d) Both the mean and the median increase.
- e) The mean and median remain the same.

\$75,000

$$\frac{10}{2} = 5$$



Ascending order

200,000  
↑  
Enter

$$\text{Mean} = \frac{250000}{10} = \$25000$$

Q53) The product of two numbers is  $-\frac{14}{27}$ . If one of the numbers is  $\frac{7}{9}$ , then the other number is:

- a)  $-\frac{3}{2}$
- b)  $\frac{3}{2}$
- c)  $\frac{2}{3}$
- d)  $-\frac{2}{3}$

$$-\frac{14}{27} \cdot X = \frac{7}{9}$$

$$X = -\frac{3}{2}$$

Q54) The mean proportion of 0.12 and 1200 is:

- a) 12
- b) 14.4
- c) 144
- d) 120

$$a : b :: b : c$$

$$\frac{a}{b} = \frac{b}{c}$$

$$b = \sqrt{ac}$$

$$\frac{a}{b} = \frac{b}{c}$$

$$b^2 = ac \Rightarrow b = \sqrt{ac}$$

$$\sqrt{\frac{9 \times 12 \times 12}{100}} = \sqrt{12^2 \times \frac{9}{100}}$$

3rd proportional

$$a : b :: b : c$$

$$2, 6, x$$

$$2 : 6 :: 6 : x$$

$$2x = 36 \Rightarrow x = 18$$

4th proportional

$$a, b, c, d$$

$$3, 4, 5, x$$

$$3 : 4 :: 5 : x$$

$$3x = 20 \Rightarrow x = \frac{20}{3}$$

$$3x = \dots$$

Q55) The ratio of the number of boys and girls in a school of 720 students is 7 : 5. How many more girls should be admitted to make the ratio 1 : 1?

- a) 220
- b) 120
- c) 90
- d) 240

$$\text{Total parts} = 12x = 720$$

$$\begin{matrix} 7:7 \\ 1:1 \end{matrix}$$

$$x = \frac{720}{12} = 60$$

$$\text{Boys} - 7x = 420$$

$$\text{Girls} - 5x = 300$$

120  
more girls are needed

Q56) Supposing that telegraph poles on a railroad are 50 meters apart, how many will be passed by a train in 2 hours if the speed of the train is 40 km/hour?

- a) 1400
- b) 1600
- c) 1200
- d) 800



$$\# \text{ of poles} = \frac{\text{Total dist}^{\text{Covered}}}{\text{distance b/w two poles}}$$

$$S = vt = 40 \frac{\text{km}}{\text{hr}} \times 2 \text{ hr}$$

$$S = 80 \text{ km} = 80,000 \text{ m}$$

$$\# \text{ of poles} = \frac{80,000}{50} = 1600$$

Q57) A general wishing to draw up his 7250 men in the form of a solid square found that he had 25 men over. What is the number of men in the front?

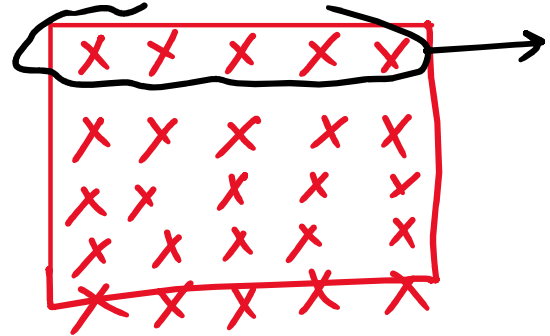
- a) 100
- b) 150
- c) 80
- d) 85

$$7250 - 25 = 7225$$

$$S^2 = 7225$$

$$85$$

$$\begin{array}{r} 85 \\ 8 \overline{) 7225} \\ \underline{64} \phantom{00} \\ 825 \end{array}$$



Q58) What is the height of a cylinder with area of base 20 cm<sup>2</sup> and volume 400 cm<sup>3</sup>?

- a) 10 cm
- b) 12 cm
- c) 13 cm
- d) 14 cm
- e) 20 cm

$$\text{Vol} = \text{height} \times \text{Base Area}$$

$$400 = h \times 20$$

$$h = \frac{400}{20} = 20$$

$$h = \frac{L}{w}$$

Q59) If  $a - b = 6$ ,  $ab = -2$ , then  $a^2 + b^2 = ?$

- a) 32
- b) 49
- c) 51
- d) 101
- e) 40

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

$$36 = a^2 + b^2 + 4$$

$$a^2 + b^2 = 32$$

$$\begin{aligned} (a+b)^2 + (a-b)^2 &= 2(a^2 + b^2) \\ (a+b)^2 - (a-b)^2 &= 4ab \end{aligned}$$

Q60) Aziz and Aslam entered into a partnership investing Rs. 12000 and Rs. 9000 respectively. After 3 months Zahid joined them with an investment of Rs. 15000. Find the share of Zahid in a half-yearly profit of Rs. 9500.

- a) Rs. 2500
- b) Rs. 3000
- c) Rs. 3500
- d) Rs. 4000

Ratios  $\Rightarrow$  Aziz : Aslam : Zahid

$$72 : 54 : 45$$

$$10 : 6 : 5$$

Investment  $\times$  Time

investment x 11%

$$8 : 6 : 5$$

Total parts = 19

$$\text{Zahid's share} = \frac{5}{19} \times 9500 = 2500$$

**Bonus MCQ)** If 11% of a number exceeds 7% of the same number by 18, the number is:

- a) 450
- b) 72
- c) 360
- d) 720

$x$

$$11\% \text{ of } x - 7\% \text{ of } x = 18$$

$$x - y = 5$$

$$x = y + 5$$

$$\frac{11x}{100} - \frac{7x}{100} = 18$$

$$4x = 1800$$

$$x = \frac{1800}{4} = 450$$

$$\frac{11}{14} \times 45^\circ - \frac{7}{14} \times 45^\circ$$

$$= 11 \times 4.5 - 7 \times 4.5$$

$$= \underline{4 \times 4.5}$$

$$\begin{array}{r} 45 \\ 1 \\ \hline 18.0 \end{array} \textcircled{2}$$