



Rao IIT Academy

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GANIT PRABHUTWA EXAMINATION

Date : 10 - 12 - 2017

Std - VIII

Total Marks : 100

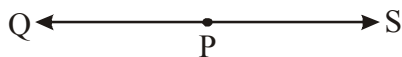
Time : 3 Hours

Q.1 A) Choose the correct alternative and write it against the correct sub – question number. (10)

- 1) Ray PQ and ray PS are opposite rays. How many points are common to the two rays ?
 (A) 0 (B) 1 (C) 2 (D) 3

Sol. (B)

Common point is 'P'



Topic : Lines / Sub Topic : Rays / Level : Easy / Ganit Prabhutwa Examination

- 2) What is the decimal form of $\frac{361}{90}$?
 (A) $4.\overline{011}$ (B) 4.01 (C) $4.000\overline{1}$ (D) $4.0\overline{1}$

Sol. (D)

$$\frac{361}{90} = \frac{360}{90} + \frac{1}{90} = 4 + \frac{1}{90}$$

$$= 4 + 0.0111\dots = \boxed{4.0\overline{1}}$$

Topic : Number System / Sub Topic : Decimals / Level : Moderate / Ganit Prabhutwa Examination

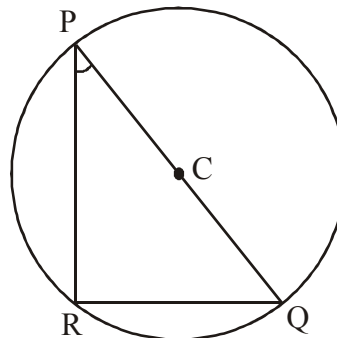
- 3) The centre of the circle passing through all the three vertices of ΔPQR lies on the side PQ.

What type of angle is $\angle P$?

- (A) acute angle (B) obtuse angle (C) right angle (D) can not be decided

Sol. (A)

Since angle R must be right angle, P must be acute angle



Topic : Circles, Triangles / Sub Topic : Circles / Level : Moderate / Ganit Prabhutwa Examination

- 4) A money lender charges Rs. 63 as interest for 6 months on Rs. 420. What is the rate of interest p.c.p.a ?

(A) 33 % (B) 13 % (C) 30 % (D) 10 %

Sol. (C)

$$\text{Time} = 6 \text{ months} = \frac{6}{12} \text{ yr} = \frac{1}{2} \text{ yr}$$

$$SI = \frac{P \times R \times T}{100} = 63$$

$$\Rightarrow \frac{420 \times R \times 1}{100 \times 2} = 63$$

$$\Rightarrow R = \frac{300}{10} = \boxed{30\%}$$

Topic : Percentages / Sub Topic : Simple Interest / Level : Moderate / Ganit Prabhutwa Examination

- 5) A shopkeeper sells an article for Rs. 240, and suffers a loss of 4 %. What should be the selling price of that article to gain a profit of 12 % ?

(A) 252 (B) 236 (C) 262 (D) 280

Sol. (D)

$$\text{Let } CP = 100x$$

After loss of 4 %

$$SP = 96x = 240$$

$$\Rightarrow x = \frac{240}{96} = \frac{10}{4} = 2.5$$

$$\text{so, C.P.} = 100 \times 2.5$$

$$= 250$$

S.P. after 12 % profit

$$= 112 \% \text{ of } 250$$

$$= \frac{112}{100} \times 250$$

$$= 56 \times 5$$

$$= \boxed{280}$$

Topic : Profit & Loss / Sub Topic : Profit and loss / Level : Moderate / Ganit Prabhutwa Examination

6) What is the averages of the numbers $7\frac{2}{3}, 3\frac{1}{4}, 0, 1, \frac{1}{12}$?

(A) 4

(B) 2.4

(C) 3

(D) 4.2

Sol. (B)

$$\frac{\left(7\frac{2}{3} + 3\frac{1}{4} + 0 + 1 + \frac{1}{12}\right)}{5}$$

$$= \frac{1}{5} \left(11 + \frac{2}{3} + \frac{1}{4} + \frac{1}{12}\right)$$

$$= \frac{1}{5} \left(11 + \frac{8+3+1}{12}\right) = \frac{1}{5} (11+1) = \frac{12}{5}$$

$$= \boxed{2.4}$$

Topic : Data Handling / Sub Topic :Averages / Level :Moderate / Ganit Prabhutwa Examination

7) What should be added to $x^2 - 2x - 11$ so that the sum will be divisible by $(x + 3)$ as well as by $(x - 5)$?

(A) 4

(B) - 4

(C) 3

(D) -3

Sol. (B)

$$x^2 - 2x - 11 + k = a(x+3)(x-5)$$

$$\Rightarrow x^2 - 2x - 11 + k = ax^2 - 2ax - 15a$$

$$\Rightarrow a = 1, -11 + k = -15$$

$$k = \boxed{-4}$$

Topic : Quadratic Equations / Sub Topic :Factorization / Level : Moderate / Ganit Prabhutwa Examination

8) If $2x = 3y$ and $5y = 6z$ find the ratio $x : z$

(A) 1 : 3

(B) 9 : 5

(C) 5 : 9

(D) 3 : 5

Sol. (B)

$$2x = 3y$$

$$5y = 6z$$

$$\frac{x}{y} = \frac{3}{2}$$

$$\frac{y}{z} = \frac{6}{5}$$

$$\text{Multiply the two ratios to get so, } \frac{x}{y} \times \frac{y}{z} = \frac{x}{z} = \frac{3}{2} \times \frac{6}{5} = \boxed{\frac{9}{5}}$$

Topic : Ratios & Proportions / Sub Topic : Ratios / Level : Easy / Ganit Prabhutwa Examination

9) Area of a circle is 1386 sq.cm. Find its diameter. $\left(\pi = \frac{22}{7}\right)$

(A) 42 cm

(B) 21 cm

(C) 132 cm

(D) 84 cm

Sol. (A)

$$\pi r^2 = 1386$$

$$\Rightarrow \frac{22}{7} r^2 = 1386$$

$$\Rightarrow r^2 = \frac{1386 \times 7}{22}$$

$$\Rightarrow r^2 = 63 \times 7$$

$$\Rightarrow r = 21$$

$$\text{Diameter} = 2r$$

$$= 2 \times 21$$

$$= \boxed{42\text{cm}}$$

Topic : Mensuration / Sub Topic : Area of circles / Level : Easy / Ganit Prabhutwa Examination

10) If $81^x = \frac{1}{3}$ then find x.

(A) 4

(B) -4

(C) $\frac{1}{4}$

(D) $-\frac{1}{4}$

Sol. (D)

$$81^x = \frac{1}{3}$$

$$\Rightarrow (3^4)^x = \frac{1}{3}$$

$$\Rightarrow 3^{4x} = 3^{-1}$$

$$\Rightarrow 4x = -1$$

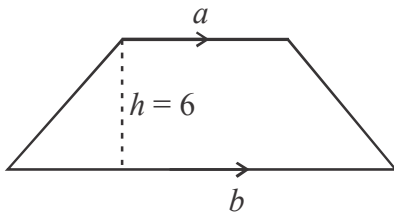
$$x = \boxed{-\frac{1}{4}}$$

Topic : Exponents & Powers / Sub Topic : Exponents / Level : Easy / Ganit Prabhutwa Examination

Q.1 B) Write only answers of each of the following sub-questions. (10)

- 1) Area of a trapezium is 84 cm^2 . Length of one of its parallel sides is 10 cm and its height is 6 cm . What is the length of the other parallel side ?

Sol. $A = 84 \text{ cm}^2$



$$84 = \frac{1}{2}(a + b) \times h$$

$$84 = \frac{1}{2}(10 + b) \times 6$$

$$10 + b = 28$$

$$b = \boxed{18 \text{ cm}}$$

Topic : Mensuration / Sub Topic : Trapezium area / Level : easy / Ganit Prabhutwa Examination

- 2) Two numbers differ by 20 . One third of the greater number is half of the smaller number. Find the numbers.

Sol. $a - b = 20$... (1)

$$\frac{1}{3}a = \frac{1}{2}b$$

$$2a - 3b = 0$$
 ... (2)

$$\begin{array}{r} 2a - 2b = 40 \\ - 2a - 3b = 0 \\ \hline b = 40 \end{array}$$

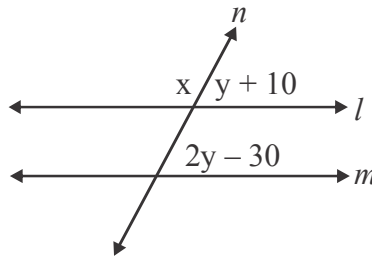
$$b = \boxed{40}$$

$$\therefore a - 40 = 20$$

$$\Rightarrow a = \boxed{60}$$

Topic : Linear Equation in one/two variable / Sub Topic : Linear Equation in one/two variable/ Level : Easy / Ganit Prabhutwa Examination

- 3) In the adjoining figure, line $l \parallel$ line m . Line n is a transversal. Find values of x and y .



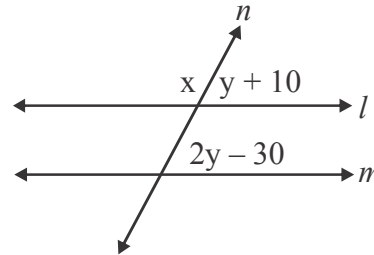
Sol. $x + y + 10 = 180$ [Linear pair]

$$x + y = 170 \quad \dots(1)$$

$$y + 10 = 2y - 30 \text{ [Corresponding angles]}$$

$$\boxed{40 = y}$$

$$x + 40 = 170 \Rightarrow \boxed{x = 130}$$

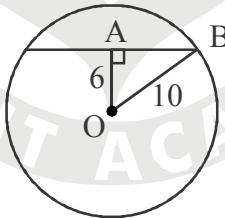


Topic : Parallel lines / Sub Topic : Crossponding angles, supplementary length of chord / Level : Easy / Ganit Prabhutwa Examination

- 4) In a circle of diameter 10 cm, a chord is at a distance of 6 cm from the centre. Find the length of the chord.

Sol. Not possible to solve using diameter as 10 cm.

Hence we assume 10 cm is given as the radius and not diameter.



In $\triangle OAB$,

$$(OB)^2 = (OA)^2 + (AB)^2$$

$$(10)^2 = (6)^2 + (AB)^2$$

$$(AB)^2 = 100 - 36$$

$$(AB)^2 = 64$$

$$AB = 8 \text{ cm}$$

$$\text{Hence length of chord} = \boxed{2AB = 16 \text{ cm}}$$

Topic : Circles / Sub Topic :Length of chord / Level :Moderate / Ganit Prabhutwa Examination

- 5) Find the condition on the values of x , so that the triangle of sides 40 cm, 37 cm, and x cm can be constructed.

Sol. (1) $40 + 37 > x$

$$\Rightarrow x < 77$$

(2) $x + 40 > 37$

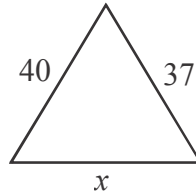
$$x > -3$$

(3) $x + 37 > 40$

$$x > 3$$

Using (1), (2) & (3)

$$\Rightarrow 3 < x < 77$$



Topic : Triangles / Sub Topic : Triangle inequality / Level : Moderate / Ganit Prabhutwa Examination

- Q.2 Solve the following sub-questions.

(15)

- 1) Factorize : $x^3 + 8y^3 + 4x^2y + 8xy^2$

Sol. $x^3 + 8y^3 + 4x^2y + 8xy^2$

$$= (x)^3 + (2y)^3 + 4xy(x + 2y)$$

$$= (x + 2y)^3 - 3(x)(2y)(x + 2y) + 4xy(x + 2y)$$

$$= (x + 2y) \left[(x + 2y)^2 - 3(x)(2y) + 4xy \right]$$

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

Topic : Factorization / Sub Topic : $(a+b)^3$ / Level : Moderate / Ganit Prabhutwa Examination

- 2) Gopal leaves home and by walking at two third of his usual speed reaches his school 10 minutes late. How much time does he take usually to reach the school from home ?

Sol. $S = \frac{D}{T}$

$$x = \frac{D}{T} \quad \dots(1)$$

$$\frac{2}{3}x = \frac{D}{T+10} \quad \dots(2)$$

From (1) & (2)

$$Tx = (T + 10) \frac{2}{3}x$$

$$3Tx = 2Tx + 20x$$

$$T = 20 \text{ mins}$$

Topic : Linear Equation in one variable / Sub Topic : Linear Equation in one variable / Level : Moderate / Ganit Prabhutwa Examination

3) Divide the polynomial $x^3 - 6x^2 + 11x - 6$ by $(x - 2)$ and write the remainder.

Sol.

$$\begin{array}{r}
 x^2 - 4x + 3 \\
 x - 2 \overline{) x^3 - 6x^2 + 11x - 6} \\
 \underline{- x^3 + 2x^2} \\
 -4x^2 + 11x - 6 \\
 \underline{- (-4x^2 + 8x)} \\
 3x - 6 \\
 \underline{- (3x - 6)} \\
 0
 \end{array}$$

$$\boxed{\text{Remainder} = 0}$$

Alternately if $p(x) = x^3 - 6x^2 + 11x - 6$, then the remainder when divided by $(x - 2)$ is

$$p(2) = 2^3 - 6 \times 2^2 + 11 \times 2 - 6 = \boxed{0}$$

Topic : Polynomials / Sub Topic : Long division / Remainder theorem / Level : Moderate / Ganit Prabhutwa Examination

4) Seema purchased 8 chocolates for Rs. 10. How many chocolates should she sell for Rs. 10 to gain a profit of 60%?

Sol. 8 chocolates \longrightarrow Rs. 10

Required profit = 60%

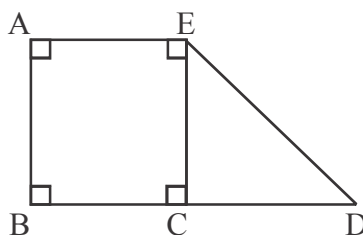
$$\therefore \text{SP for 8 chocolates} = \left(\frac{160}{100}\right) \times 10 = 16 \text{ Rs.}$$

Hence SP of one chocolate = 2 Rs.

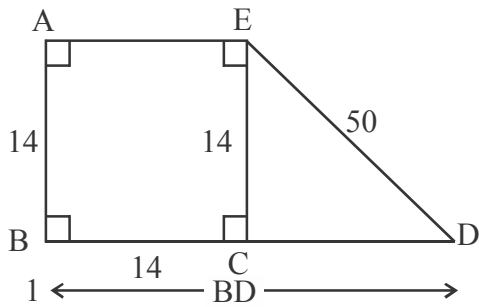
Hence for 10 Rs. number of chocolates to be sold $= \frac{10}{2} = \boxed{5}$ chocolates.

Topic : Profit and Loss / Sub Topic : Profit and Loss / Level : Moderate / Ganit Prabhutwa Examination

5) In the adjoining figure, $\square ABCE$ is a square with side 14 cm. If B, C, D are collinear and $l(ED) = 50$ cm, find $l(BD)$.



Sol.



In $AECD$,

$$(ED)^2 = (EC)^2 + (CD)^2$$

$$(50)^2 = (14)^2 + (CD)^2$$

$$(CD)^2 = (50)^2 - (14)^2 = (50 - 14)(50 + 14)$$

$$= 36 \times 64 \Rightarrow CD = 6 \times 8 = 48 \text{ cm}$$

$$\text{Hence } BD = BC + CD = 14 + 48 = \boxed{62 \text{ cm}}$$

Topic : Pythagorus theorem / Sub Topic : Pythagorus theorem / Level : Moderate / Ganit Prabhutwa Examination

Q.3 Solve, the following sub-questions.

(20)

1) If $a + b - c = 6$, and $a^2 + b^2 + c^2 = 29$, find the value of $ab - bc - ac$.

Sol. $a + b - c = 6$... (i)

$$a^2 + b^2 + c^2 = 29$$
 ... (ii)

$$(a + b - c)^2 = 6^2$$

$$\Rightarrow a^2 + b^2 + c^2 + 2(ab - ac - bc) = 36$$

Using equation (ii)

$$29 + 2(ab - ac - bc) = 36$$

$$(ab - ac - bc) = \frac{7}{2} = \boxed{3.5}$$

Topic : Algebraic Identities / Sub Topic : $(x+y+z)^2$ / Level : Moderate / Ganit Prabhutwa Examination

2) Two years before, a machine was purchased for Rs. 62500. If its price reduces by 10% every year, what is the price of that machine today?

Sol. C.P = Rs. 62500

Price reduces 10% per year.

So, it becomes $\left(\frac{9}{10}\right)^{th}$ after every year.

After two years,

$$\text{Price will be} = 62500 \times \frac{9}{10} \times \frac{9}{10}$$

$$= 625 \times 81$$

$$= \boxed{50625 \text{ Rs.}}$$

Topic : Percentages / Sub Topic : Percentages / Level : Moderate / Ganit Prabhutwa Examination

- 3) Mohan bought a bicycle for Rs. 1040. He paid the amount in the form of notes of Rs. 100, Rs. 50 and Rs. 20. Number of 100 rupee notes was half of 50 rupee notes and number of 20 rupee notes was three times the number of 100 rupee notes. Find the number of notes of each denomination.

Sol. Let there be x number of 100 rupees notes

Hence number of 50 rupees notes = $2x$

Hence number of 25 rupees notes = $3x$

$$\Rightarrow 100x + 50(2x) + 20(3x) = 1040$$

$$\Rightarrow 10x + 10x + 6x = 104$$

$$\Rightarrow 26x = 104$$

$$x = 4$$

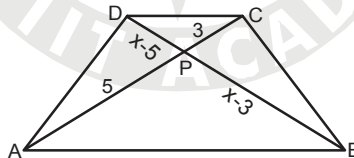
Rs.100 \rightarrow 4 notes

Rs.50 $\rightarrow 2 \times 4 =$ 8 notes

Rs.20 $\rightarrow 3 \times 4 =$ 12 notes

Topic : Linear Equation in one variable / Sub Topic : Linear Equation in one variable / Level : Moderate / Ganit Prabhutwa Examination

- 4) In the adjoining figure, $\square ABCD$ is a trapezium.



Seg. $AB \parallel$ seg. DC

Find the value of x .

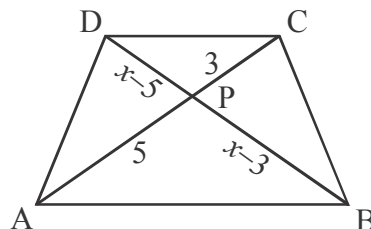
Sol. $\triangle APB \sim \triangle CPD$

$$\Rightarrow \frac{AP}{CP} = \frac{PB}{PD} \Leftrightarrow \frac{5}{3} = \frac{x-3}{x-5}$$

$$\Leftrightarrow 5x - 25 = 3x - 9$$

$$\Leftrightarrow 2x = 16$$

$$\Leftrightarrow \boxed{x = 8}$$



Topic : Geometry / Sub Topic : Geometry of Δ^s / Level : Moderate / Ganit Prabhutwa Examination

5) $216^x = 1296^{-1/4} \times 6^{x-1}$. Find the value of x .

Sol. $216^x = 1296^{-1/4} \times 6^{x-1}$

$$\Rightarrow (6^3)^x = \frac{1}{(1296)^{1/4}} \times 6^{x-1}$$

$$\Rightarrow 6^{3x} = \frac{1}{(6^4)^{1/4}} \times 6^{x-1}$$

$$\Rightarrow 6^{3x} = \frac{1}{6} \times 6^{x-1}$$

$$\Rightarrow 6^{3x} = 6^{-1} \times 6^{x-1}$$

$$\Rightarrow 6^{3x} = 6^{x-2}$$

$$\Rightarrow 3x = x - 2$$

$$\Rightarrow 2x = -2$$

$$\Rightarrow \boxed{x = -1}$$

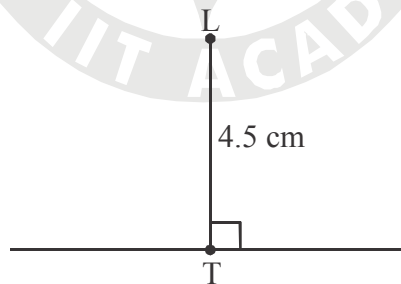
Topic : Exponents & Powers / Sub Topic : Exponents & Powers / Level : Moderate / Ganit Prabhutwa Examination

Q.4 Solve, the following sub-questions.

(20)

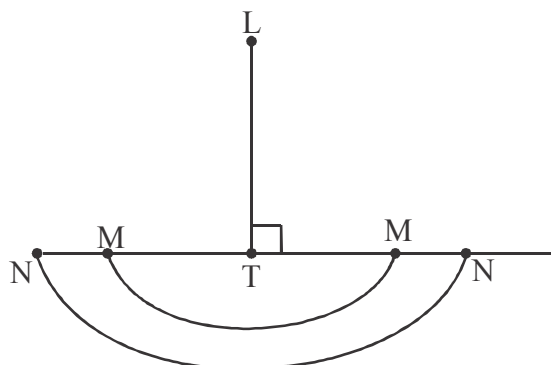
1) Construct $\triangle LMN$ such that $l(LM) = 5.2$ cm, $l(LN) = 5.7$ cm, height $LT = 4.5$ cm.

Sol. Step (1) : First draw any line & draw length LT perpendicular to it of length 4.5 cm. (Drawing perpendicular to a line is a standard procedure)

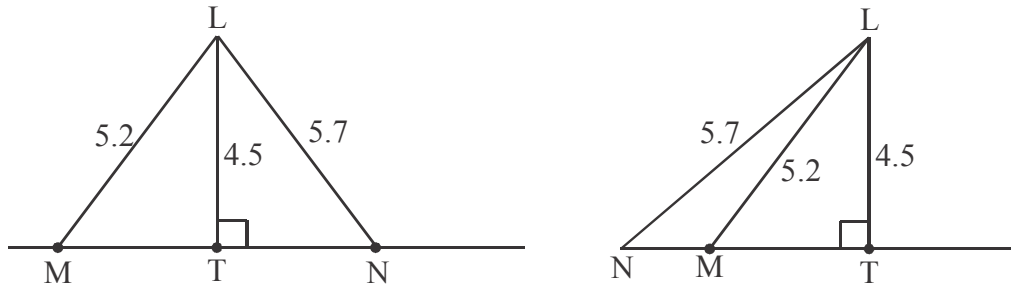


Step (2) : Take distance $LM = 5.2$ in compass & draw an arc with L as centre of cutting the line in M . Similarly take distance $LN = 5.7$ cm in compass & draw an arc with L as centre & cutting line in N .

Note that there will be two possibilities for points M & N as shown.



Hence total 2 non-congruent triangles possible as shown.



Topic : Construction / Sub Topic : Construction of Δ^s / Level :Moderate / Ganit Prabhutwa Examination

2) The L.C.M. of two number is fourteen times their G.C.D. The sum of the G.C.D and the L.C.M is 600. Find two pairs of such numbers.

Sol. LCM = 14 GCD and LCM + GCD = 600

$$\Rightarrow 14 (\text{GCD}) + \text{GCD} = 600$$

$$\Leftrightarrow \text{GCD} = 40 \text{ and LCM} = 560$$

$$\text{As GCD} = 2^3 \cdot 5 \text{ and LCM} = 2^4 \cdot 5 \cdot 7$$

\Rightarrow One of the numbers must have 2^3 in the factorization and the other should have 2^4 as a factor.

Both numbers should have 5 in the factorization but only one number should have 7 in the factorization.

This gives two pairs of numbers as $2^3 \cdot 5 \cdot 7, 2^4 \cdot 5$ and $2^3 \cdot 5, 2^4 \cdot 5 \cdot 7$

$$\text{i.e. } \boxed{280; 80} \text{ and } \boxed{40; 560}$$

Topic : LCM & GCD / Sub Topic : LCM & GCD / Level : Moderate_ / Ganit Prabhutwa Examination

3) Perimeters of a rectangle and a square are equal. The ratio of the length and breadth of the rectangle is 5 : 4. Find the ratio of the length of the rectangle to the side of the square.

Sol. Take length and breadth of rectangle as $5x$ and $4x$

$$\Rightarrow \text{perimeter of rectangle} = \text{perimeter of square} = 18x$$

$$\Rightarrow \text{side length of square} = \frac{9x}{2}$$

$$\Rightarrow \frac{\text{length of rectangle}}{\text{side of square}} = \frac{5x}{9x/2} = \boxed{10:9}$$

Topic : Ratio & Proportion / Sub Topic : Rectangles & squares / Level : Moderate / Ganit Prabhutwa Examination

4) Solve, $\frac{x}{2} + 1 = \frac{1}{2} \left(3x + \frac{2}{3} \right)$.

Sol. $\frac{x}{2} + 1 = \frac{1}{2} \left(3x + \frac{2}{3} \right)$

Multiply both side by 6

$$\Leftrightarrow 6 \left(\frac{x}{2} + 1 \right) = 6 \cdot \frac{1}{2} \left(3x + \frac{2}{3} \right)$$

$$\Leftrightarrow 3x + 6 = 9x + 2$$

$$\Leftrightarrow 6 - 2 = 9x - 3x$$

$$\Leftrightarrow 4 = 6x$$

$$\Leftrightarrow \boxed{x = \frac{2}{3}}$$

Topic : Linear Equation in one variable / Sub Topic : Linear Equation in one variable / Level : Easy / Ganit Prabhutwa Examination

5) A train running at a speed of 90 km/hr, crosses a bridge in 36 seconds. Another train having length 100 meters less, is running at a speed of 45 km/hr. In how much time will the train cross the same bridge?

Sol. Total distance needed to cross a bridge

= length of bridge + length of train

= speed \times time

for first train, it is $= 90 \times \frac{36}{3600} = (0.9) \text{ km} = 900 \text{ m}$

for the second train, it will be 100 m less = 800 m

= speed \times time

$$\Rightarrow \text{time required} = \frac{800 \text{ m}}{45 \text{ km/hr}} = \frac{0.8}{45} = \frac{8}{450} \text{ hrs}$$

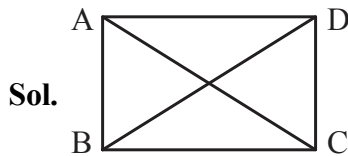
$$= \frac{8}{450} \times 3600 \text{ seconds} = \boxed{64 \text{ seconds}}$$

Topic : Linear Equation in one variable / Sub Topic : Linear Equation in one variable / Level : Moderate / Ganit Prabhutwa Examination

Q.5 Solve the following sub-question.

(25)

1) $\square ABCD$ is a rectangle. Prove that seg. $AC \cong$ seg. BD



$\triangle ABD \cong \triangle CDB$ by RHS congruency test as hypotenuse BD is common and $\angle BAD = \angle BCD = 90^\circ$

Hence $AB = CD$

Now,

$\triangle ABC \cong \triangle DCB$ by SAS congruency test.

as $AB = CD$, BC is the common side and $\angle ABC = \angle DCB = 90^\circ$

$$\Rightarrow \boxed{AC = DB}$$

Topic : Geometry / Sub Topic : Rectangles / Level : Easy / Ganit Prabhutwa Examination

2) The price of sugar is increased by 20%. By what percent the consumption of sugar be reduced so that expenditure on sugar will remain the same?

Sol. If the base price of sugar = $100x$ Rs/kg

then the final increased price = $100x \cdot \frac{120}{100} = 120x$ Rs / kg

Let initial consumption = y kg

\Rightarrow initial expenditure = $100xy$ Rs.

Since final expenditure = initial expenditure

= $100xy$ Rs.

$$\Rightarrow \text{final consumption} = \frac{\text{final expenditure}}{\text{final price}} = \frac{100xy}{120x}$$

$$= \frac{5y}{6} \text{ kg}$$

$$\Rightarrow \text{reduction in consumption} = y - \frac{5y}{6} = \frac{y}{6} \text{ kg}$$

$$\Rightarrow \% \text{ reduction} = \frac{y/6}{y} \times 100 \approx \boxed{16.67\%}$$

Topic : Percentages / Sub Topic : Percentages / Level : Moderate / Ganit Prabhutwa Examination

3) **Factorize :** $1 + 2x + 2yz + x^2 - y^2 - z^2$.

Sol. $1 + 2x + 2yz + x^2 - y^2 - z^2$

$$= (1 + 2x + x^2) - (y^2 - 2yz + z^2)$$

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

$$= (x+1-(y-z))(x+1+(y-z)) \quad \dots \text{ using } a^2 - b^2 = (a-b)(a+b)$$

$$= \boxed{(x+z-y+1)(x-z+y+1)}$$

Topic : Factorization / **Sub Topic :** $(a+b)^2$ / **Level :** Moderate / Ganit Prabhutwa Examination

4) In a terminal examination Arun scored 82 marks in mathematics. Ajit scored 5 marks less than Amit and Amit scored 4 marks more than the average marks of the class. If the average of marks of Arun, Ajit and Amit is 2 more than the average of marks of the class, find the average of marks of the class.

Sol. Let average marks of the class = x

$$\Rightarrow \text{Amit's marks} = x + 4$$

$$\Rightarrow \text{Ajit's marks} = (x + 4) - 5 = x - 1$$

$$\Rightarrow \text{Average of Arun, Ajit and Amit's marks}$$

$$= \frac{82 + (x-1) + x + 4}{3} = \frac{85 + 2x}{3}$$

$$= 2 \text{ more than class average}$$

$$= x + 2$$

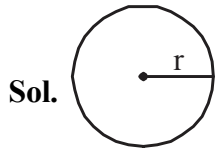
$$\Leftrightarrow 85 + 2x = 3(x + 2)$$

$$\Leftrightarrow 85 - 6 = 3x - 2x$$

$$\Leftrightarrow \boxed{x = 79}$$

Topic : Linear Equation in one variable / **Sub Topic :** Linear Equation in one variable / **Level :** Moderate / Ganit Prabhutwa Examination

- 5) A copper wire is bent to form a circle whose area is 616 sq. cm. If the same wire is bent to form a square, what will be the area of that square? $\left(\pi = \frac{22}{7}\right)$.



Let the perimeter of the wire = $p = 2\pi r$

$$\Rightarrow r = \frac{p}{2\pi}$$

$$\Rightarrow \text{Area} = \pi r^2 = \pi \frac{p^2}{4\pi^2} = \frac{p^2}{4\pi} = 616 \text{ cm}^2$$

$$\Leftrightarrow p^2 = 616 \cdot 4\pi = 616 \cdot 4 \cdot \frac{22}{7} = 88 \cdot 4 \cdot 22 = 88 \cdot 88 \text{ cm}^2$$

$$\Leftrightarrow p = \pm 88 \text{ as } p > 0 \Rightarrow p = 88 \text{ cm}$$

Hence perimeter of the square = 88 cm

$$\Rightarrow \text{side} = \frac{p}{4} = 22 \text{ cm}$$

$$\Rightarrow \text{Area of square} = \left(\frac{p}{4}\right)^2 = 22^2 = \boxed{484} \text{ cm}^2$$

Topic : Mensuration / Sub Topic : Area of circle / square / Level : Easy / Ganit Prabhutwa Examination