



# Rao IIT Academy

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## GANIT PRABHUTWA EXAMINATION-2018

Date: 09.12.2018

Std. VIII

Time: 3 hrs.  
Max.Marks : 100

**N.B. For Q. No. 2 to 5 proper procedure and explanation is necessary.**

**Q.1 Choose the correct alternative answer in each of the following. [10 M]**

1.  $(0.1)^5 = \dots\dots$

- (A) 0.1                      (B) 1                      (C) 0.001                      (D) 0.00001

Sol: (D)

$$(0.1)^5 = (10^{-1})^5 = 10^{-5} = \frac{1}{100000} = 0.00001$$

***Topic: Integers, Decimals & Fractions / Sub-topic: Decimals / L-Easy / Ganit Prabhutwa Examination***

2. Find the hypotenuse of a right angled triangle having sides 20 and 21

- (A) 29                      (B) 28                      (C) 41                      (D) 25

Sol: (A)

$$c^2 = a^2 + b^2$$

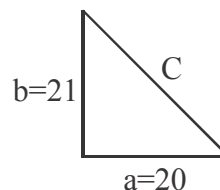
$$c^2 = 20^2 + 21^2$$

$$= 400 + 441$$

$$= 841$$

$$c^2 = 841$$

$$c = \sqrt{841} = 29$$



***Topic: Geometry / Sub-topic: Triangles / L-Easy / Ganit Prabhutwa Examination***

3. Find the value of  $a^2 + b^2$  if  $a + b = 12$  and  $ab = 10$

- (A) 124                      (B) 104                      (C) 164                      (D) 144

Sol: (A)

$$a + b = 12 ; ab = 10$$

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

$$12^2 = a^2 + b^2 + 2(10)$$

$$144 - 20 = a^2 + b^2$$

$$\Rightarrow a^2 + b^2 = 124$$

**Topic: Algebra / Sub-topic: / L-Easy / Ganit Prabhutwa Examination**

4. Which member of the set  $\{2, 3, 5, 7, 9, 11, 13\}$  is not a prime number ?

- (A) 2                                      (B) 11                                      (C) 9                                      (D) 5

Sol: (C)

9 is not a prime number.

$$\therefore 9 = 3 \times 3$$

**Topic: Number System / Sub-topic: Prime Numbers / L-Easy / Ganit Prabhutwa Examination**

5. Which of the following is the product of 8,937 and 125 ?

- (A) 93700                                      (B) 937000                                      (C) 7496500                                      (D) 4685000

Sol: (B)

The given three numbers are 8; 937; 125

$$8 \times 937 \times 125$$

$$937 \times 125 \times 8$$

$$937 \times 1000$$

$$937000$$

**Topic: Integers, Decimals & Fractions / Sub-topic: Integers / L-Easy / Ganit Prabhutwa Examination**

6. Find  $x : y : z$  if  $2x = 3y = 4z$

- (A) 6 : 4 : 3                                      (B) 2 : 3 : 4                                      (C) 4 : 3 : 8                                      (D) 3 : 2 : 3

Sol: (A)

$$2x = 3y = 4z = k$$

$$x = \frac{k}{2}; y = \frac{k}{3}; z = \frac{k}{4}$$

$$x : y : z = \frac{k}{2} : \frac{k}{3} : \frac{k}{4}$$

$$= \frac{1}{2} : \frac{1}{3} : \frac{1}{4}$$

$$= 6 : 4 : 3$$

**Topic: Ratios and Proportions / Sub-topic: Proportions / L-Easy / Ganit Prabhutwa Examination**

7. Find the difference between the simple interest and the compound interest on Rs. 1600 at the rate 5 p.c.p.a. for 2 years.  
 (A) Rs. 160                      (B) Rs. 80                      (C) Rs. 4                      (D) Rs. 5

Sol: (C)

$$S.I. = \frac{PTR}{100} = \frac{1600 \times 2 \times 5}{100} = 160$$

$$C.I. = P \left( 1 + \frac{r}{100} \right)^t - P$$

$$= 1600 \left( 1 + \frac{5}{100} \right)^2 - 1600$$

$$1600 \left( \frac{441}{400} - 1 \right)$$

$$1600 \times \frac{41}{400} = 164$$

$$C.I. - S.I. = 164 - 160$$

$$= \text{Rs. } 4$$

*Topic: Simple Interest and Compound Interest / Sub-topic: / L-Medium / Ganit Prabhutwa Examination*

8. Find the middle term (geometric mean) of 0.25 and 400.  
 (A) 10                      (B) 1                      (C) 100                      (D) 0.1

Sol: (A)

$$b^2 = ac \quad a, b, c \rightarrow \text{geometric progression}$$

$$b^2 = 400 \times 0.25$$

$$b^2 = 4 \times 25$$

$$b = \sqrt{4 \times 25}$$

$$b = \sqrt{100} = 10$$

*Topic: Sequence and Series / Sub-topic: Geometric Progressions / L-Easy / Ganit Prabhutwa Examination*

9. Mohanlal got a profit  $\frac{1}{4}$  of the cost price when he sold an article for Rs. 400. Find the profit percent.  
 (A) 40                      (B) 10                      (C) 25                      (D) 20

Sol: (C)

Let cost price be  $x$

$$\text{profit} = \frac{x}{4} \quad \text{Selling price} = 400$$

$$\text{Profit percentage} = \frac{\text{Profit}}{C.P} \times 100$$

$$= \frac{x/4}{x} \times 100$$

$$= 25\%$$

**Topic: Profit and Loss / Sub-topic: / L-Medium / Ganit Prabhutwa Examination**

10. Whole numbers  $m, n$  are such that  $m^n = 121$ . Find the value of  $(m-1)^{n+1}$
- (A) 1024                      (B) 10000                      (C) 1                      (D) 1000

Sol: (D)

$$m^n = 121 \Rightarrow 11^2 = 121$$

$$m = 11, n = 2$$

$$(m-1)^{n+1} = (11-1)^{2+1} = 10^3 = 1000$$

**Topic: Number System / Sub-topic: Exponents / L-Medium / Ganit Prabhutwa Examination**

(B) Write only answer of each of the following subquestions. [10 M]

1. The sides of a rectangle are 24 cm and 18 cm. Find the perimeter of the square drawn on its diagonal.

Sol. In  $\triangle BCD$ :

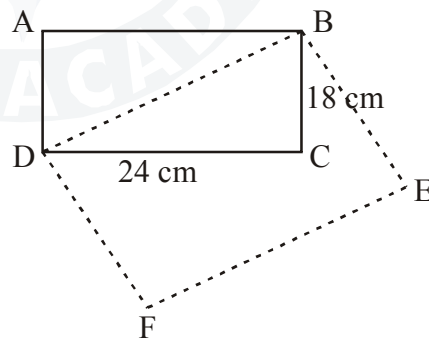
$$BD^2 = BC^2 + CD^2$$

$$= (24)^2 + (18)^2$$

$$= 576 + 324$$

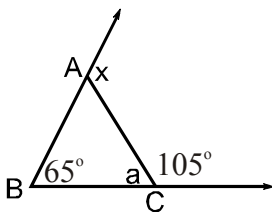
$$BD^2 = 900 \text{ cm}$$

$$BD = 30 \text{ cm}, \text{ perimeter} = 4 \times 30 = 120 \text{ cm}$$



**Topic: Mensuration / Sub-topic: Rectangles / L-Medium / Ganit Prabhutwa Examination**

2. Find the values of  $x$  and  $a$ , from the information given in the adjoining figure.



Sol.  $\angle ACP + \angle ACB = 180^\circ$

$$\therefore 105^\circ + a = 180^\circ$$

$$a = 180^\circ - 105^\circ$$

$$a = 75^\circ$$

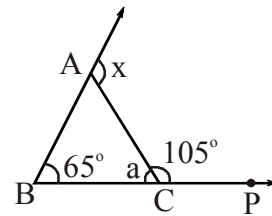
Also,  $\angle ABC + \angle ACB = x$  {external angle of a triangle}

$$65^\circ + a = x$$

$$x = 65^\circ + 75^\circ$$

$$x = 140^\circ$$

$$\therefore x = 140^\circ, a = 75^\circ$$



**Topic: Lines and Angles / Sub-topic: / L-Medium / Ganit Prabhutwa Examination**

3. Rakhi completes a task in 10 days, while Rama takes 5 days to finish the same task. If they work together, in how many days will they finish the task ?

Sol. Rakhi completes a task in 10 days.

In one day, Rakhi completes  $\frac{1}{10}$  of the task.

Similarly, in one day, Rama completes  $\frac{1}{5}$  of the task.

If Rakhi and Rama completes the task in 'x' days working together.

In one day, they will do  $\frac{1}{x}$  of the task.

$$\therefore \frac{1}{10} + \frac{1}{5} = \frac{1}{x}$$

$$\frac{1}{x} = \frac{1+2}{10}$$

$$x = \frac{10}{3} \text{ days}$$

$\therefore$  They will finish the task in  $\frac{10}{3}$  or 3.33 days.

**Topic: Time and Work / Sub-topic: / L-Easy / Ganit Prabhutwa Examination**

4. If  $18^3 = 5832$ , then find the value of  $\sqrt[3]{5.832} \times 5^2$ .

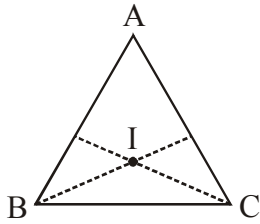
Sol.  $18^3 = 5832$

$$\sqrt[3]{5.832} \times 5^2 = \sqrt[3]{5832 \times 10^{-3}} \times 5^2 = 18 \times 10^{-1} \times 25 = 45$$

**Topic: Integers, Decimals & Fractions / Sub-topic: Decimals / L-Easy / Ganit Prabhutwa Examination**

5. The bisectors of  $\angle B$  and  $\angle C$  of  $\triangle ABC$  meet at incentre I.  $m\angle A = 54^\circ$ , find the measure of  $\angle BIC$ .

Sol.



In  $\triangle ABC$ ,  $\angle A + \angle B + \angle C = 180^\circ$

$$54^\circ + \angle B + \angle C = 180^\circ$$

$$\angle B + \angle C = 126^\circ \quad \dots(i)$$

In  $\triangle BIC$ ,  $\angle IBC + \angle ICB + \angle BIC = 180^\circ \quad \dots(ii)$

But  $\angle IBC = \frac{1}{2}\angle B \quad \dots(iii) \{ \because \text{the angles are bisected} \}$

and  $\angle ICB = \frac{1}{2}\angle C \quad \dots(iv)$

$\therefore$  from (ii), (iii), (iv)

$$\frac{1}{2}\angle B + \frac{1}{2}\angle C + \angle BIC = 180^\circ$$

$$\frac{1}{2}(\angle B + \angle C) + \angle BIC = 180^\circ$$

$$\frac{1}{2} \times 126^\circ + \angle BIC = 180^\circ$$

$$\therefore \angle BIC = 180^\circ - 63^\circ$$

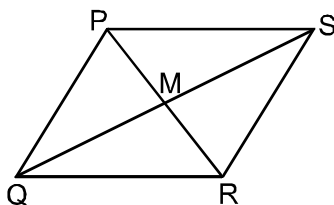
$$\therefore \angle BIC = 117^\circ$$

**Topic: Geometry / Sub-topic: Triangles / L-Medium / Ganit Prabhutwa Examination**

**Q.2 Solve the following :**

**[15 M]**

1.  $\square PQRS$  is a rhombus :  $m\angle MQR = 40^\circ$ . Find the measures of;  $\angle QSR, \angle PQR, \angle QPS$ .



Sol. Given:  $\angle MQR = 40^\circ$

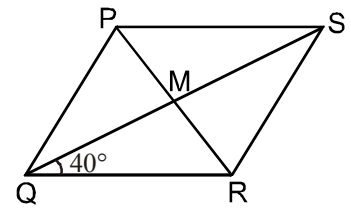
$$\angle PQR = 2\angle MQR \quad \{\because QM \text{ is angle bisector of } \angle PQR\}$$

$$= 2 \times 40^\circ = 80^\circ$$

$$\angle QRS + \angle PQR = 180^\circ$$

$$\therefore \angle QRS = 180^\circ - 80^\circ$$

$$\angle QRS = 100^\circ$$



In  $\triangle QRS$ :

$$\angle QRS + \angle QSR + \angle SQR = 180^\circ$$

$$100^\circ + \angle QSR + 40^\circ = 180^\circ \quad \{\because \angle SQR = \angle MQR\}$$

$$\Rightarrow \angle QSR = 40^\circ$$

Also,  $\angle QPS = \angle QRS$

$$\angle QPS = 100^\circ$$

$$\therefore \angle QSR = 40^\circ, \angle PQR = 80^\circ \text{ and } \angle QPS = 100^\circ$$

**Topic: Quadrilaterals and Polygons/ Sub-topic: Quadrilaterals/ L-Medium / Ganit Prabhutwa Examination**

2. Exactly at what time between 2 and 3 will the hour hand overlap the minute hand ?

Sol. At 2 o' clock, hour hand will be at 2 and minute hand will be at 12.

In one hour, hour hand covers  $= \frac{360^\circ}{12} = 30^\circ$  per hour.

$$\therefore \text{In one minute, hour hand cover} = \frac{30^\circ}{60 \text{ min}} = \left(\frac{1}{2}\right)^\circ \text{ per minute.}$$

Also, in one minute, minute hand covers  $= \frac{360^\circ}{60} = 6^\circ$  per minute

$\therefore$  Let they meet after  $x$  minutes :

$$\therefore 6x = 60^\circ + \frac{1}{2}x$$

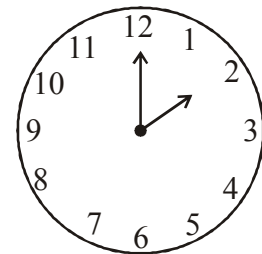
$$\Rightarrow 6x - \frac{x}{2} = 60^\circ$$

$$\frac{11x}{2} = 60^\circ$$

$$x = \frac{120}{11} \text{ minutes}$$

$\therefore$  They will after  $\frac{120}{11}$  or 10.909 minutes or

$$10 \text{ minutes} + \frac{10}{11} \times 60 \text{ seconds}$$



$\Rightarrow$  10 minutes + 55 seconds

$\therefore$  They will overlap at 2 hours 10 minutes and 55 seconds

**Topic: Geometry / Sub-topic: / L-Medium / Ganit Prabhutwa Examination**

3. Find the average of the first 20 consecutive odd numbers.

Sol. First 20 consecutive odd numbers are 1, 3, 5, ----

$$\begin{aligned} \therefore \text{Sum} &= \frac{n}{2} [2a + (n-1)d] \\ &= \frac{20}{2} [2 \times 1 + (20-1)2] \\ &= 10 [2 + 19 \times 2] \\ &= 10 [2 + 38] \\ &= 10 \times 40 \\ &= 400 \\ \text{Average} &= \frac{400}{20} = 20 \end{aligned}$$

**Topic: Sequence and Series / Sub-topic: Arithmetic Progression / L-Easy / Ganit Prabhutwa Examination**

4. By simple interest, a certain amount triples in 12 years at a certain rate of interest. Find the rate of interest.

Sol. Let rate of interest be R

$$\therefore 3P = P + \frac{P \times R \times (12)}{100} \quad \{\therefore T = 12 \text{ years}\}$$

$$\therefore 3 = 1 + \frac{12R}{100}$$

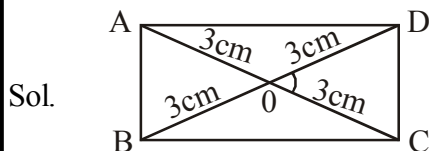
$$\frac{12R}{100} = 2$$

$$R = \frac{2 \times 100}{12}$$

$$R = \frac{50}{3} \% = 16.67\% \text{ p.a.}$$

**Topic: Simple Interest and Compound Interest / Sub-topic: Simple Interest / L-Medium / Ganit Prabhutwa Examination**

5. Construct a rectangle having diagonal 6.0 cm and the measure of an angle between the diagonals  $120^\circ$ .



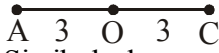
Clearly  $CO = 3 \text{ cm}$   
 $OD = 3 \text{ cm}$



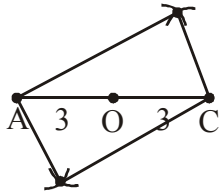
i) With the help of ruler draw a line segment AC of length 6 cm and mark its mid point O on it.



ii) With the help of compass draw an arc of radius 3 cm from O and from C on one side of line segment AC to get point D.



iii) Similarly draw an arc from O and from A on other side of line segment AC to get point B. Join ABCD

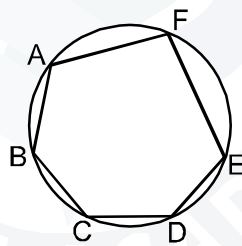


**Topic: Constructions / Sub-topic: / L-Medium / Ganit Prabhutwa Examination**

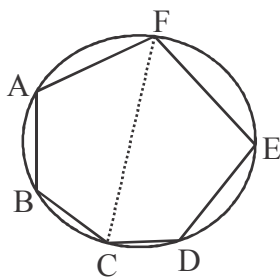
**Q.3 Solve the following subquestions.**

**[20 M]**

1. The points A, B, C, D, E, F lie on a circle. Find  $m\angle BAF + m\angle FED + m\angle DCB$ .



Sol.



Join F and C

Now, FEDC is a cyclic quadrilateral

also, FABC is a cyclic quadrilateral

Now,  $\angle FED + \angle FCD = 180^\circ \dots\dots (i)$  (opposite angles of a cyclic quadrilateral)

also  $\angle BAF + \angle FCB = 180^\circ \dots\dots (ii)$  (opposite angles of a cyclic quadrilateral)

Now adding (i) and (ii)

$$\angle FED + \angle FCD + \angle BAF + \angle FCB = 180^\circ + 180^\circ$$

$$= 360^{\circ}$$

$$\angle BAF + \angle FED + \angle DCB = 360^{\circ} \quad \{ \because \angle DCB = \angle FCB + \angle FCD \}$$

**Topic: Quadrilaterals and Polygons/ Sub-topic: Polygons/ L-Medium / Ganit Prabhutwa Examination**

2. GCD of two numbers is 23 and their product is 19044. Find all possible pairs of such numbers.

Sol. Let the numbers be x, y

$$GCD \text{ of } x, y = 23$$

$$xy = 19044$$

∴

$$LCM = \frac{19044}{23} = 828$$

$$GCD \text{ of } x, y = 23, \quad LCM = 828 = 23 \times 36$$

$$LCM \text{ of } x, y = 23 \times 2^2 \times 3^2$$

$$\text{Numbers can be } (23, 828), (23 \times 2^2, 23 \times 3^2)$$

$$(23, 828) \text{ and } (92, 207)$$

**Topic: Number System/ Sub-topic: HCF and LCM / L-Difficult / Ganit Prabhutwa Examination**

3) Simplify  $\frac{x^2 - 12x + 27}{x^2 - 7x - 18}$

$$\text{Sol. } \frac{x^2 - 12x + 27}{x^2 - 7x - 18} = \frac{(x-3)(\cancel{x-9})}{(\cancel{x-9})(x+2)}$$

$$= \frac{x-3}{x+2}$$

$$\left[ \text{or } \frac{x+2-5}{x+2} = 1 - \frac{5}{x+2} \right]$$

**Topic: Algebra/ Sub-topic: Quadratic equation/ L-Easy / Ganit Prabhutwa Examination**

4) Solve:  $\frac{1-x}{6} + \frac{2x}{3} - \frac{1-7x}{4} = 2\frac{1}{6}$

$$\text{Sol. } \frac{1-x}{6} + \frac{2x}{3} - \frac{1-7x}{4} = \frac{2 \times 6 + 1}{6}$$

$$\frac{1-x}{6} + \frac{8x-3+21x}{12} = \frac{13}{6}$$

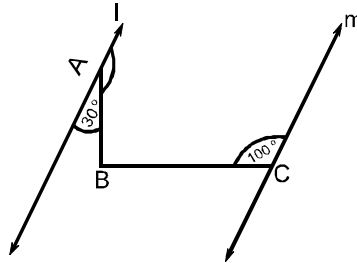
$$2 - 2x + 29x - 3 = 26$$

$$27x = 27$$

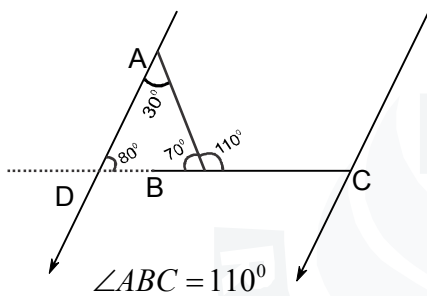
$$\boxed{x = 1}$$

**Topic: Algebra / Sub-topic: / L-Medium / Ganit Prabhutwa Examination**

5) In the adjoining figure, line  $\ell \parallel$  line  $m$ . From the information given in the figure find the measure of  $\angle ABC$ .



Sol.



**Topic: Lines and Angles / Sub-topic: / L-Easy / Ganit Prabhutwa Examination**

**Q.4) Solve the following subquestions.**

**[20 M]**

1. Divide  $(x^4 + 4)$  by  $(x^2 + 2x + 2)$ . Find quotient and remainder. Write answer as  
 dividend = divisor  $\times$  quotient + remainder

Sol.

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

$$\therefore \text{Quotient} = x^2 - 2x + 2$$

$$\text{Remainder} = 0$$

$$\therefore x^4 + 4 = (x^2 + 2x + 2)(x^2 - 2x + 2) + 0$$

**Topic: Algebra / Sub-topic: / L-Medium / Ganit Prabhutwa Examination**

2. The speed of a boat in still water is 25 km/hr. The time required for the boat to travel 120 km against the stream is  $\frac{3}{2}$  times the time required to travel the same distance along the same stream. Find the speed of the stream.

Sol. Let speed of stream =  $x$  km / hr

$$\therefore \text{Speed against stream} = (25 - x) \text{ km / hr}$$

$$\text{Speed along stream} = (25 + x) \text{ km / hr}$$

$$\text{Time} = \frac{\text{distance}}{\text{speed}}$$

$$\therefore \text{Time against stream} = \frac{3}{2} (\text{Time along stream})$$

$$\frac{120}{25 - x} = \frac{3}{2} \times \frac{120}{25 + x}$$

$$2(25 + x) = 3(25 - x)$$

$$5x = 25$$

$$x = 5 \text{ km / hr}$$

**Topic: Time, Speed and Distance / Sub-topic: / L-Medium / Ganit Prabhutwa Examination**

3. Solve:  $\sqrt{6^o + \frac{2}{3}} = (0.6)^{2-3x}$

Sol.  $\sqrt{6^o + \frac{2}{3}} = (0.6)^{2-3x}$

$$\sqrt{1 + \frac{2}{3}} = \left(\frac{6}{10}\right)^{2-3x}$$

$$\sqrt{\frac{5}{3}} = \left(\frac{3}{5}\right)^{2-3x}$$

$$\left(\frac{5}{3}\right)^{\frac{1}{2}} = \left(\frac{5}{3}\right)^{3x-2}$$

$$\therefore 3x - 2 = \frac{1}{2}$$

$$3x = 2 + \frac{1}{2}$$

$$\boxed{x = \frac{5}{6}}$$

**Topic: Algebra / Sub-topic: Exponents / L-Easy / Ganit Prabhutwa Examination**

4. If a polygon has 90 diagonals, then find the number of sides of the polygon.

Sol. Number of diagonals =  $\frac{n(n-3)}{2}$

$$\therefore \frac{n^2 - 3n}{2} = 90$$

$$n^2 - 3n = 180$$

$$n^2 - 3n - 180 = 0$$

$$(n+12)(n-15) = 0$$

$$\therefore n = -12 \text{ (Rejected)}$$

$$\boxed{n = 15}$$

**Topic: Geometry / Sub-topic: Polygons / L-Medium / Ganit Prabhutwa Examination**

**Q.5) Solve the following subquestions.**

[25 M]

1. Factorise :  $(x^2 + 8x)(x^2 + 8x + 5) - 14$

Sol.  $(x^2 + 8x)(x^2 + 8x + 5) - 14$

$$\text{Let } x^2 + 8x = y$$

$$= y(y + 5) - 14$$

$$= y^2 + 5y - 14$$

$$= (y - 2)(y + 7)$$

$$= (x^2 + 8x - 2)(x^2 + 8x + 7) \quad (\because x^2 + 8x = y)$$

$$= (x^2 + 8x - 2)(x + 1)(x + 7)$$

Consider :  $x^2 + 8x - 2$

$$\text{Roots} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-8 \pm \sqrt{64 + 8}}{2}$$

$$= \frac{-8 \pm \sqrt{72}}{2}$$

$$= \frac{-8 \pm 6\sqrt{2}}{2}$$

$$= -4 \pm 3\sqrt{2}$$

$$\therefore [x - (-4 + 3\sqrt{2})][x - (-4 - 3\sqrt{2})][x + 1][x + 7]$$

**Topic: Algebra / Sub-topic: Factorisation / L-Medium / Ganit Prabhutwa Examination**

2. Find  $x^3 - \frac{1}{x^3}$  if  $3x - 4 = \frac{3}{x}$

Sol.  $3x - \frac{3}{x} = 4$

$$x - \frac{1}{x} = \frac{4}{3}$$

On cubing,

$$\left(x - \frac{1}{x}\right)^3 = \frac{64}{27}$$

$$x^3 - \frac{1}{x^3} - 3x \cdot \frac{1}{x} \left(x - \frac{1}{x}\right) = \frac{64}{27}$$

$$x^3 - \frac{1}{x^3} - 3(1) \left(\frac{4}{3}\right) = \frac{64}{27}$$

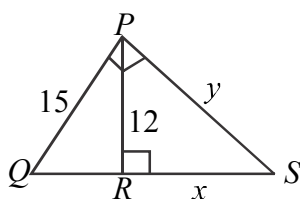
$$x^3 - \frac{1}{x^3} = \frac{64}{27} + 4$$

$$x^3 - \frac{1}{x^3} = \frac{172}{27}$$

**Topic: Algebra / Sub-topic: / L-Medium / Ganit Prabhutwa Examination**

3. In the adjoining figure,  $\angle QPS = 90^\circ$ ,  $\angle QPR \cong \angle PSR$ ,  $PR \perp QS$ ,  $PS = y$ ,  $RS = x$ ,  $PR = 12$ ,  $PQ = 15$ .

- then - (i) Prove  $\triangle QPS$  is similar to  $\triangle QRP$   
 (ii) Find the values of  $x, y$ .



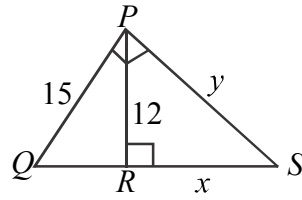
Sol. In  $\triangle QPS$  &  $\triangle QRP$

$$\angle QPS = \angle QRP = 90^\circ$$

$$\angle PQS = \angle RQP \text{ (same angles)}$$

Thus  $\triangle QPS$  and  $\triangle QRP$  are similar by  $A-A$  test

$$\therefore \frac{QP}{QR} = \frac{QS}{QP} = \frac{PS}{RP}$$



Also in  $\triangle PQR$

$$PQ^2 = QR^2 + PR^2$$

$$\therefore 15^2 = QR^2 + 12^2$$

$$\therefore QR = 9$$

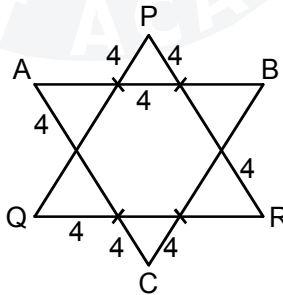
$$\therefore \frac{15}{9} = \frac{QS}{15} = \frac{PS}{12}$$

$$\therefore \frac{5}{3} = \frac{9+x}{15} = \frac{y}{12}$$

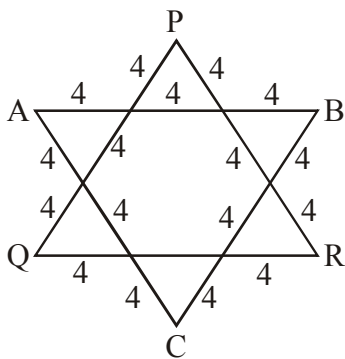
$$\therefore \boxed{x = 16 \text{ and } y = 20}$$

**Topic: Geometry / Sub-topic: Triangles / L-Medium / Ganit Prabhutwa Examination**

4. In the adjoining figure  $\triangle ABC$  and  $\triangle PQR$  are congruent. All small triangles are congruent, each side of small triangle is 4 find the area of the figure.



Sol.



$$\text{Area of the figure} = \text{Area of } \triangle PQR \text{ (equilateral with side length} = 12)$$

$$+ 3 \text{ (area of smaller equilateral triangles with side length} = 4)$$

$$= \frac{\sqrt{3}}{4}(12)^2 + 3 \times \frac{\sqrt{3}}{4}(4)^2$$

$$= 36\sqrt{3} + 12\sqrt{3} = 48\sqrt{3} \text{ sq.units}$$

**Topic:Geometry/ Sub-topic:Triangles and Polygons\_ / L-Medium / Ganit Prabhutwa Examination**

5. Some kg of tea at the rate of Rs. 320 per kg is mixed with 5 kg of tea at the rate of Rs. 280 per kg. Now the rate of the mixture so formed is Rs. 300 per kg. How much tea of the rate of Rs. 320 per kg was taken?

Sol. Let the amount of tea of Rs. 320 per kg taken be  $x$  kg.

Mixture contains  $x$  kg. of Rs. 320 per kg tea. + 5 kg. of Rs. 280 per kg tea.

$$\text{Rate of mixture} = \frac{x(320) + 5(280)}{x + 5} = 300$$

$$320x + (280)5 = 300(x + 5)$$

$$32x + 140 = 30x + 150$$

$$2x = 10$$

$$x = 5 \text{ kg.}$$

**Topic:Mixtures/ Sub-topic: / L-Medium / Ganit Prabhutwa Examination**