Fr. Agnel School

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1st Unit Test Exam

Std. : 10th **Sub : Mathematics -II** **Total Marks : 20**

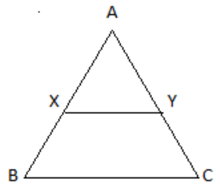
Q I. A. Choose the correct alternative answer for each of the following sub questions. **(2)**

i) In a right-angled triangle, if sum of the squares of the sides making right angle is 169 then what is the length of the hypotenuse?

A) 15 B) 13 C) 5 D) 12

ii) In the figure alongside seg XY || seg BC, then which of the following statement is true?

A) $\frac{AX}{XB}=\frac{AY}{AC}$ B) $\frac{AX}{XB}=\frac{AY}{YC}$ C) $\frac{AX}{YC}=\frac{AY}{XB}$ D) $\frac{AB}{YC}=\frac{AC}{XB}$



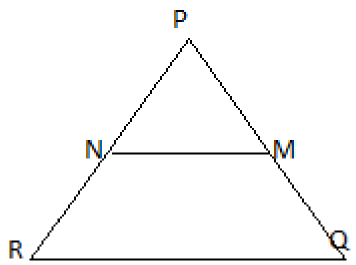
Q. I B. Solve **(2)**

i) ΔABC ~ ΔPQR and AB:PQ =2:3. Find A(ΔABC):A(ΔPQR).

ii) Do sides 3cm, 4cm, 5cm form a right angled triangle?

Q. II A. Complete the following activity any 1 **(2)**

i) In ΔPQR, side NM || side RQ, If PN=12 cm, NR= 8cm, PM= 15 cm then find MQ.



Solution: In ΔPQR, side NM|| side RQ

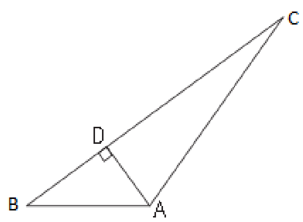
$\therefore \frac{PN}{NR}=\frac{PM}{MQ}$...... $\boxed{}$

$\therefore \boxed{} = \frac{15}{MQ}$

$\therefore$ 12MQ = $\boxed{}$

$\therefore$ MQ = $\boxed{}$

ii) In ΔABC, seg AD ⊥ seg BC. Prove that $AB^2+CD^2=BD^2+AC^2$



Solution: In ΔADC,

AC^2 = $\boxed{}$ .....Pythagoras Theorem

$\therefore AD^2 = \boxed{\quad}$ ....(1)

In ΔADB,

$AB^2 = AD^2 + BD^2$

$\therefore AD^2 = \boxed{\quad}$ ....(2)

$\therefore \boxed{\quad} = AC^2 - CD^2$....... From (1)& (2)

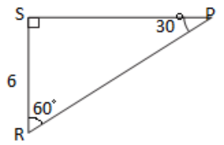
$\therefore AB^2 + CD^2 = AC^2 + BD^2$

Q. II B Solve any 2 **(4)**

i) Find the diagonal of a rectangle whose length is 16cm and area is 192 sq cm.

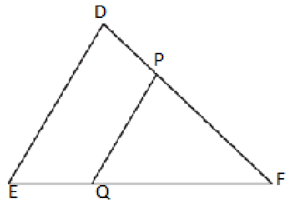
ii) Ratios of areas of two triangles of equal height is 2:3. If base of the smaller triangle is 6cm then what is the corresponding base of the bigger triangle?

iii) Observe the figure alongside. Find RP and PS using the information given in ΔPSR.



Q. III A. Complete the following activity. **(3)**

i) In the figure alongside, seg PQ| | seg DE, A(ΔPQF)= 20 units, PF= 2DP, then find A(□DPQE) by completing the following activity.



Solution: A(ΔPQF)= 20 units ...... Given

PF = 2DP

Let us assume DP=x ∴PF= 2x

DF= DP+ PF= x+2x = 3x

In ΔFDE and ΔFPQ,

∠FDE ≅ ∠FPQ ...... Corresponding angles

∠FED ≅ $\boxed{\quad}$ ...... Corresponding angles

∴ ΔFDE ~ ΔFPQ ...... $\boxed{\quad}$

$\therefore \frac{A(\Delta FDE)}{A(\Delta FPQ)} = \boxed{\quad} = \frac{(3x)^2}{(2x)^2} = \frac{9}{4}$

A(ΔFDE) $= \frac{9}{4}$ A(ΔFPQ)= $\boxed{\quad}$ = 45

∴ A(□DPQE) = $\boxed{\quad}$ - $\boxed{\quad}$

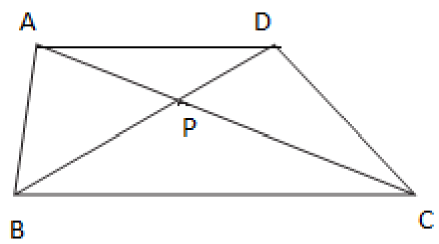
= 45 – 20

= 25 sq unit

Q. III B. Solve any 1 **(3)**

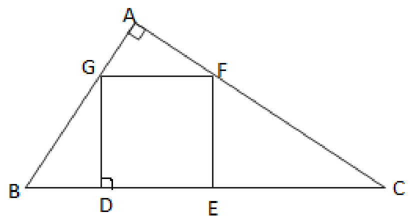
i) Prove that in a right-angled triangle, if the altitude is drawn to the hypotenuse, then the two triangles formed are similar to the original triangle and to each other.

ii) In □ABCD, Seg AD| | seg BC. Diagonal AC and diagonal BD intersect each other in point P. Then show that $\frac{AP}{PD} = \frac{PC}{BP}$.



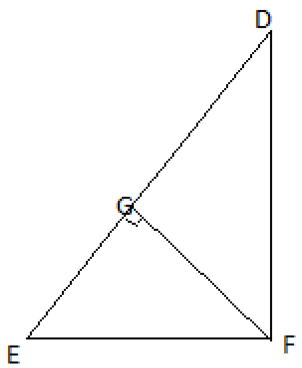
Q. IV Solve any 1 **(4)**

i) In the figure, the vertices of square DEFG are on the sides of ΔABC, ∠A= 90°. Then prove that DE^2 = BD X EC.



ii) In the figure alongside ∠DFE=90°, FG ⊥ ED, If GD =8, FG= 12, find

1) EG 2) FD 3) EF



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