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Concept Of Quadratic Equation Of Right Angled Triangle To Relation All Mathematics Method

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Abstract

In this research paper, the equation of right angled triangle explained in the form of quadratic equation. In this research paper, the main quadratic equation of right angled triangle is x^2-B(ΔPQR)x+2.A(ΔPQR)=0 , which is outcome of 'Basic theorem of sidemeasurement relation of isosceles right angled triangle and scalene right angled triangle' .
If the value of **a** is not equal to 1 (a≠1), then the quadratic equation of right angled triangle is ax^2 -B(ΔPQR)x+2.a.A(ΔPQ`R`)=0 [ax^2- b x+ c =0] and if the value of **a** is 1(a=1), then quadratic equation of right angled triangle is x^2-B(ΔPQR)x+2.A(ΔPQR)=0 [x^2- bx+ d =0]. In this Research Paper Three methods of quadratic equation of right angled triangle are explained i.e.
i) Factorization method of right angled triangle
ii) Completing square of method of right angled triangle
iii)Formula method of right angled triangle
We are trying to give a new concept "Relation All Mathematics" to the world. I am sure that this concept will be helpful in Agricultural, Engineering, Mathematical world etc.

Keywords:
Right angled triangle, Sidemeasurement, Relation, Formula, Quadratic equation .

I. Introduction

Relation All Mathematics is a new field and various relations shown in this research, "Concept of Quadratic equation of right angled triangle to relation all mathematics method ". It is one of the important research paper in the Relation All Mathematics and in future, any research related to this concept, that must be part of " Relation Mathematics " subject. Here, we have studied and shown new variables, letters, concepts, relations, and theorems. Inside the research paper, new concept of Quadratic equation about Right angled triangle is explained.We have explained a new concept i.e. Sidemeasurement, which is very important related to ‘Relation Mathematics’ subject.

In this research paper, the main quadratic equation of Right angled triangle is mentioned as x^2-B(ΔPQR)x+2.A(ΔPQR)=0 or a.x^2 - B(ΔPQR)x+ a.2.A(ΔPQ`R`) =0, it is proved with the help “Basic theorem of sidemeasurement relation of isosceles right angled triangle and scalene right angled triangle. ”.

This quadratic equation of right angled triangle used when sidemeasurement and area are given and we need to find base and height of Right angled triangle with the help of quadratic equation. Quadratic equation of Right angled triangle explained in the form of ax^2-bx+c =0. Here if value of a is 1 i.e.(a=1), then this quadratic equation is explained as x^2 - B(ΔPQR) x + 2.A(ΔPQR)) =0 and in this paper maximum use value of a is 1, but if value of a is not equal to 1 i.e. (a≠1), then this quadratic equation explained as, a.x^2 - B(ΔPQR)x + a.2.A(ΔPQ`R`) =0 [ax^2-bx+c =0]. In this equation cleared that, Coefficient of x^2 = a, Coefficient of x= b, constant c =a. c`. Also following three concept are used to solve quadratic equation of Right angled triangle -

i)Factorization method of Right angled triangle

ii)Completing square of method of right angled triangle

iii)Formula method of right angled triangle

Now change in quadratic equation of Right angled triangle, its details description and it`s coefficient relation are cleared in this Research paper.

In this “Relation All Mathematics” we have shown quadratic equation of right angled triangle. This “Relation All Mathematics” research work is near by 300 pages. This research is prepared considering the Agricultural sector mainly, but I am sure that it will also be helpful in other sector.

II. Basic concept

2.1. Explanation of quadratic equation of right angled triangle :-

Condition I :- a=1

when a=1,then quadratic equation of right angled triangle explain as x^2 - B(ΔPQR) x+ 2.A(ΔPQR) =0

i.e. x^2 - b x+ d=0 … here a=1, b= B(ΔPQR) and d= 2.A(ΔPQR) which is constant .

Condition II :- a≠1

when a≠1,then quadratic equation of right angled triangle explain as,

ax^2 - B(ΔPQR) x+ a.2.A(ΔPQ`R`) =0 i.e. ax^2 - b x+ c=0

… here a≠1, b= B(ΔPQR) and c= a.c`= a.2.A(ΔPQ`R`) which is constant .

ax^2 - bx+ a.c` =0

ax^2 - bx+ c =0

2.2. Sidemeasurement(B) :-If sides of any geometrical figure are in right angle with each other , then those sides or considering one of the parallel and equal sides after adding them, the addition is the sidemeasurement .sidemeasurement indicated with letter 'B'

Sidemeasurement is a one of the most important concept and maximum base of the Relation All Mathematics depend apoun this concept.

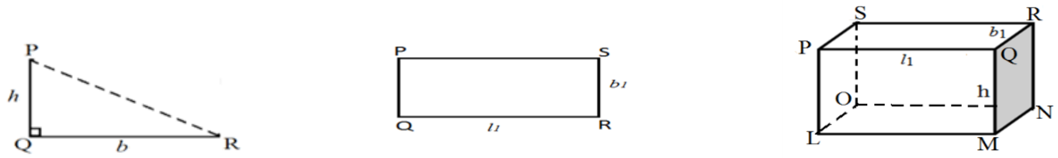

Figure I : Concept of sidemeasurement relation

I) Sidemeasurement of right angled triangle - B (ΔPQR) = $b + h$

In **Δ**PQR ,sides PQ and QR are right angle, performed to each other .

II) Sidemeasurement of rectangle-B(□PQRS)= $l_1 + b_1$

In □ PQRS, opposite sides PQ and RS are similar to each other and m<Q = 90^o .here side PQ and QR are right angle performed to each other.

III) Sidemeasurement of cuboid–E_B(□PQRS) = $l_1 + b_1 + h_1$

In E(□PQRS),opposite sides are parallel to each other and QM are right angle performed to each other. Sidemeasurement of cuboid written as = E_B(□ PQRS)

2.3)Important points of square-right angled triangle relation :-

I) For explanation of square and right angled triangle relation following variables are used

i) Area	– A
ii) Perimeter	– P
iii) Sidemeasurement	– B

II) For explanation of square and right angled triangle relation following letters are used

i) Area of square ABCD	– A (□ABCD)
ii) Perimeter of square ABCD	– P (□ABCD)
iii) Sidemeasurement of square ABCD	– B (□ABCD)
iv) Area of right angled triangle PQR	– A (ΔPQR)
v) Perimeter of right angled triangle PQR	– P (ΔPQR)
vi) Sidemeasurement of right angled triangle PQR	– B (ΔPQR)

III. Concept of quadratic equation of right angled triangle

Quadratic equation of right angled triangle –

Quadratic equation of right angled triangle is defind as, "An equation that employs the variable of right angled triangle b_1 or h_1 having the general form ax^2-bx+c=0. In this equation multification of a and c (a.c`) is area and b is sidemeasurment of right angled triangle also a is never equal to zero and the variable is squared which will not aquire higher power.

Variable of right angled triangle quadratic equation(x) –

Base(b_1) and height(h_1) explain quadratic equation of right angled triangle, so it is called variable of quadratic equation of right angled triangle

But when quadratic equation is explained with variable base (b_1) then factors of that equation is in the form of height(h_1) and vise varsa. Variable of quadratic equation of right angled triangle is two i.e. b_1 and h_1.

Assume x instead of variables $b_1$and h_1.

Now quadratic equation of right angled triangle written as ,

x^2 – B(ΔPQR) x + 2.A(ΔPQR)=0

3.1) Basic proof of quadratic equation method in quadratic equation of right angled triangle

Known information:

In ΔABC and ΔPQR ,

A (ΔABC) = A(ΔPQR)

$l^2 = b_1 \times h_1$ … (here $b_1 > l$) , Fig.2.3

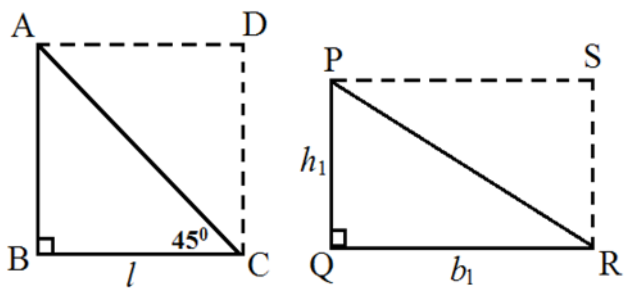

Figure II : Basic proof of quadratic equation of right angled triangle

To prove : b_1^2 - B(ΔPQR) b_1+ 2.A(ΔPQR) =0

Proof :In ΔABC and ΔPQR,

B(ΔPQR)= B(Δ ABC) x $\frac{1}{2}\left[\frac{(n^2+1)}{n}\right]$

…("Basic theorem of sidemeasurement relation of isosceles right angled triangle and scalene right angled triangle. ".)

$B(\Delta PQR)=\frac{1}{2}(2\,l) \times \left[\frac{(b_1^2+l^2)}{l.b_1}\right]$ … $\left[\frac{(n^2+1)}{n}\right]=\left[\frac{(b_1^2+l^2)}{l.b_1}\right]=\left[\frac{(h_1^2+l^2)}{l.h_1}\right]$

$B(\Delta PQR) = \left[\frac{(b_1^2+l^2)}{b_1}\right]$

$B(\Delta PQR)\, b_1 = b_1^2 + (b_1 . h_1)$ … $l^2 = b_1 . h_1$

$B(\Delta PQR)\, b_1 = b_1^2 + 2\, A(\Delta PQR)$

$b_1^2 - (b_1+h_1)\, b_1 + b_1.h_1 = 0$

$b_1^2 - B(\Delta PQR)\, b_1 + 2\, A(\Delta PQR) = 0$

This is basic proof of quadratic equation of Right angled triangle .
When area and sidemeasurement of Right angled triangle are given then with the help of Quadratic equation of right angled triangle , we can find base and height of the Right angled triangle .here $b_1^2 - B(\Delta PQR)\, b_1 + 2.A(\Delta PQR) = 0$ and $h_1^2 - B(\Delta PQR)\, h_1 + 2.A(\Delta PQR) = 0$ are two types of explanation which give basic proof of quadratic equation of Right angled triangle.

I) Concept of Factorization method of right angled triangle -

Roots of quadratic equation of right angled triangle by factorization method is base(b_1) and height(h_1) of that right angled triangle.

Basic proof of Factorization method of right angled triangle -

I) Concept of factorization method of Right angled triangle in first quadent

Known information-In ΔPQR

$l^2 = l_1 \times h_1$ … (here , $l_1 > l$)

Sidemeasurement of $\Delta PQR = B(\Delta PQR)$

$a = 1$,$b = B(\Delta PQR) = (b_1+h_1)$,$c = A(\Delta PQR) = \frac{1}{2}\, b_1.h_1$

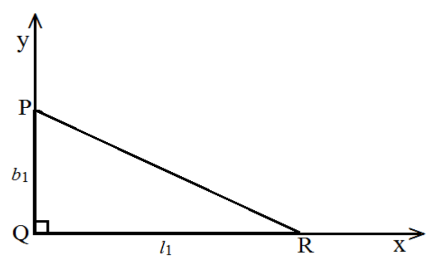

Figure III : Factorization method of Right angled triangle in first quadent

To prove - Factors of Right angled triangle= { b_1, h_1}

Proof - In first quadent of ΔPQR ,

x^2 - $B(\Delta PQR)\,x$ + $2.A(\Delta PQR)=0$

… Basic proof of quadratic equation of right angled triangle

$x^2 - (b_1+h_1)\,x + b_1.h_1 = 0$

$x^2 - (h_1 + b_1)\,x + b_1.h_1 = 0$

$x^2 - h_1\,x - b_1 x + b_1.h_1 = 0$

$x(x-h_1) - b_1(x-h_1) = 0$

$(x- b_1)\,(x-h_1) = 0$

$x- b_1 = 0\ ,\ x - h_1 = 0$

$x= b_1\ ,\ x = h_1$

In this concept factorization method of Right angled triangle is used to solve quadratic equation of Right angled triangle.

This method clears, when area and sidemeasurement of Right angled triangle are given and to find base and height of Right angled triangle in first quadent.

In short -

Concept of factorization method of Right angled triangle:-

Sidemeasurement of Right angled triangle = $(b_1+h_1)= B(\Delta PQR)$

Area of Right angled triangle = $\frac{1}{2}\, b_1.h_1= A(\Delta PQR)$

Basic formula of factorization method of Right angled triangle =

$x^2 - B(\Delta PQR)x+2.A(\Delta PQR) =0$

Factors of Right angled triangle = (b_1,h_1)

ii) Concept of factorization method of Right angled triangle in second quadent

Sidemeasurement of Right angled triangle = $(h_1- l_1)= B(\Delta PQR)$

Area of Right angled triangle = $-(l_1.h_1)= - 2.A(\Delta PQR)$

Basic formula of factorization method of Right angled triangle in second quadent-

$x^2 - B(\Delta PQR)x-2.A(\Delta PQR) =0$

$x^2 - (h_1- l_1)x - l_1.h_1 = 0$

Factors of Right angled triangle ` = $\{ - l_1.h_1 \}$

iii) Concept of factorization method of Right angled triangle in third quadent -

Concept of factorization method of Right angled triangle

Sidemeasurement of Right angled triangle = $-(l_1+ h_1)=B(\Delta PQR)$

Area of Right angled triangle =$(l_1.h_1) = 2.A(\Delta PQR)$

Basic formula of factorization method of Right angled triangle –

$x^2 - B(\Delta PQR)x+ 2.A(\Delta PQR) =0$

$x^2 + (l_1 + h_1)x + l_1.h_1 = 0$

Factors of Right angled triangle = { $-l_1.-h_1$ }

iv) Concept of factorization method of Right angled triangle in forth quadent

Concept of factorization method of Right angled triangle

Sidemeasurement of Right angled triangle = $(l_1 - h_1)$ = B(ΔPQR)

Area of Right angled triangle =$-(l_1.h_1)$ = 2.A(ΔPQR)

Basic formula of factorization method of Right angled triangle –

x^2 - B(ΔPQR)x+2.A(ΔPQR) =0

$x^2 - (l_1 - h_1)x - l_1.h_1 = 0$

Factors of Right angled triangle ={ $l_1.-h_1$ }

3.3) Coefficient relation of right angled triangle

x^2-bx+d =0 is basic proof of quadratic equation of right angled triangle .Inside it coefficient of x^2 is 1 .that mean twice area of right angled triangle is 2.A(ΔPQR) which is indicated with letter 'd'and sidemeasurement B(ΔPQR) which is indicated with letter 'b'.At this time that right angled triangle base b_1 and height h_1 respectively .If we change the base and height of right angled triangle in ratio 1:1, then coefficient of x^2 i.e. a is created and multiplication of a^2 & c is the area i.e. 'd'.

Now the new coefficient relation of factorization method of right angled triangle is explained below.

3.3-i) Relation :- Proof of Coefficient relation of right angled triangle

Known information:

In ΔPQR, a=1 and quadratic equation of right angled triangle is ,

x^2 -B(ΔPQR)x+2.A(ΔPQR)=0.in this equation base and height of right angled triangle is b_1 and h_1 .but ,when ΔPQR is converted in the form of ΔPQ`R`where a≠1 ,then base and height of that right angled triangle is l_1/a and h_1/a .With the help of this equation, base and height of right angled triangle change in equal ratio, then changes occured in their area which is explained in this coefficient relation of right angled triangle

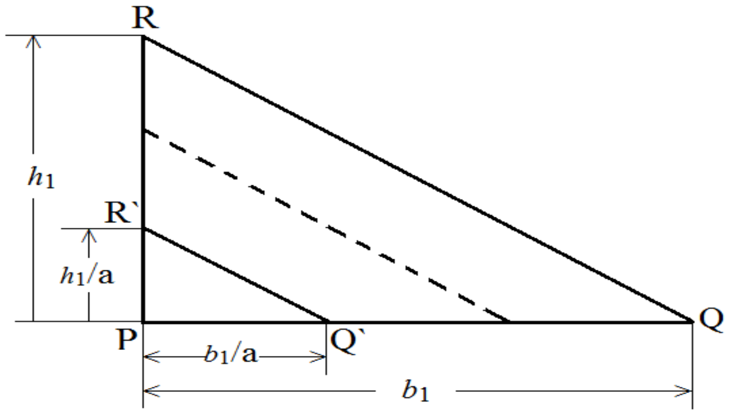

Figure IV : Coefficient relation of right angled triangle

To prove - $\frac{A(\Delta PQR)}{A(\Delta PQ`R`)} = a^2$

Proof - In right angled triangle ΔPQR ,

$A(\Delta PQR) = \frac{1}{2} b_1 . h_1$ ...(i)

In right angled triangle ΔPQ`R`,

$A(\Delta PQ`R`) = \frac{1}{2} \frac{b_1}{a} . \frac{h_1}{a}$ ...(ii)

$\frac{A(\Delta PQR)}{A(\Delta PQ`R)} = \frac{b_1 h_1}{\left[\frac{b_1}{a} . \frac{h_1}{a}\right]}$ from equation (i) and (ii)

$\frac{A(\Delta PQR)}{A(\Delta PQ`R`)} = a^2$

This formula clears if the change in base and height happens in equal ratio and Sidemeasurement of right angled triangle in equation no changed then we can find change in area with the help of this formula .

3.3-ii) Concept of coefficient relation in quadratic equation of right angled triangle

Coefficient relation of Right angled triangle ,cleared that 2.A(ΔPQR) = a^2.A(ΔPQ`R`)= d .here a is change in side ratio of Right angled triangle .so now quadratic equation Right angled triangle explained as , a.x^2 - B(ΔPQR)x + 2.a. A(ΔPQ`R`) =0 .Inside this equation ,coefficient of x^2 = a ,coefficient of x = b,and constant = c. i.e. When quadratic equation of right angled triangle explained then its explanation given in the form of , ax^2- bx+a.c`=0.

Part of 'a'in quadratic equation of right angled triangle –Inside ax^2- bx+a.c`=0, a is "Area coefficient of right angled triangle" which is has coefficient of x^2 .

Area coefficient of right angled triangle- Area coefficient of right angled triangles difind as, a real number which indicated base and height of right angled triangle incrigeous and decrigeous in how many equal part in the ratio of 1:1 .

Part of 'b' in quadratic equation of right angled triangle – In ax^2-bx+a.c`=0 , b is coefficient of $x$ and it`s value b is B(ΔPQR) i.e. Sidemeasurement.

Part of 'c' in quadratic equation of right angled triangle –Inside ax^2-bx+a.c`=0 , a.c` is constant of the quadratic equation of Right angled triangle .here a^2.c`= 2.A(ΔPQR)=d .Twice area of right angled triangle is made up from maltification of coefficient of $x^2$ and constant of equation .i.e. a.c`=c.
In this quadratic equation a=1, then constant is indicated area of right angled triangle 2.A(ΔPQR) , at that time base and height of right angled triangle is b_1 and h_1.but if a≠ 1 then base and height of Right angled triangle is b/a and h/a.
here, 2.A(ΔPQR)= b_1. h_1=a^2.c = a^2 x 2.A(ΔPQ`R`)=d.

x^2 - bx+ d=0 is main proof of quadratic equation right angled triangle .At this time 1 is a coefficient of x^2 .i.e.twice area and Sidemeasurement of right angled triangle is d i.e. 2.A(ΔPQR) and b i.e. B(ΔPQR) .In this condition base and height of right angled triangle is b_1 and h_1.now this base and height incrigeous and decrigeous then coefficefient of x^2 is a .now become quadratic equation of right angled triangle is
ax^2 - bx + c =0 here a≠1 . b= B(ΔPQR) and c=a.c` is constant.

Think it over :-
If Area of right angled triangle is d [2.A(ΔPQR)] and sidemeasurement b [B(ΔPQR)] at that time value of a is 1.
As , 2.A(ΔPQR)= a^2 x c`
= a^2 x 2.A(ΔPQ`R`)
= a x a x 2.A(ΔPQ`R`)
= a x c but , a=1
= d c=d (a=1)
= 2.A(ΔPQR) = $b_1 . h_1$

3.3-iii) Proof of coefficient relation of factorization method in quadratic equation of right angled triangle
Known information: -Quadratic equation of right angled triangle is ax^2 - bx+ c =0 .
a≠1 , b= B(ΔPQR) ' c = constant
To prove :- ax^2 - bx+ c =0
Proof :- In right angled triangle ΔPQR ,
x^2 - bx+ d =0 `

… Concept of quadratic equation of right angled triangle

x^2 - B(ΔPQR)x+ 2.A(ΔPQR)=0

A(ΔPQR)= A(ΔPQ`R`) . a^2

. . . Proof of Coefficient relation of right angled triangle

x^2 - B(ΔPQR)x + 2.A(ΔPQ`R`) . a^2=0 … a≠1

x^2 - bx+ c` .a^2=0

ax^2 - bx+ c` .a =0

ax^2 - bx+ c =0

Hence ,we are proof that coefficient relation of factorization method in quadratic equation of right angled triangle**.** In this proof explained that when coefficient of x^2 is 'a` then a is cleared that base and height of right angled triangle is $b_1$/a and $h_1$/a .at that time area of right angled triangle 2.A(ΔPQ`R`) is $b_1.h_1/a^2$

II) Concept of completing square method of right angled triangle –

If critical to find base and height with factorization method of right angled triangle .At that time we can easy to find base and height with the help of completing square method of right angled triangle. Now we are study about completing square method of right angled triangle.

3.4) Basic proof of completing square method in quadratic equation of right angled triangle -

Known information: In ΔPQR ,Sidemeasurement of ΔPQR = B(ΔPQR)

Area of ΔPQR = A(ΔPQR)

a =1 ,b =B(ΔPQR))=(b_1+h_1) ,c = A(ΔPQR)= $\frac{1}{2}$ $b_1.h_1$

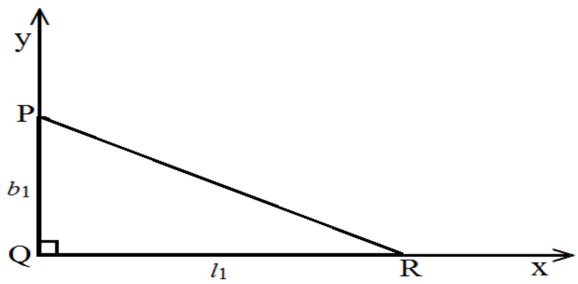

Figure V : Completing square method in quadratic equation of right angled triangle

To prove :- $\left[x - \frac{B(\Delta PQR)}{2}\right]^2 = \frac{[B(\Delta PQR)]^2 - 8.A(\Delta PQR)}{4}$

Proof :- x^2 – B(ΔPQR) x + 2.A(ΔPQR)=0

. . . Basic proof of quadratic equation method of right angled triangle

x^2 - B(ΔPQR)x = - 2.A(ΔPQR) …(i)

Third term = $[\frac{1}{2}$ x coefficient of $x\,]^2$

$= [\frac{1}{2}$ x - B(ΔPQR)$]^2$

$= \frac{[B(\Delta PQR)]^2}{4}$

Add the $\frac{[B(\Delta PQR)]^2}{4}$ in both sides of equation (i) ,

$$x^2 - B(\Delta PQR)x + \frac{[B(\Delta PQR)]^2}{4} = \frac{[B(\Delta PQR)]^2}{4} - 2.A(\Delta PQR)$$

$$\left[x - \frac{B(\Delta PQR)}{2}\right]^2 = \frac{[B(\Delta PQR)]^2 - 8.A(\Delta PQR)}{4}$$

Hence we are proof Basic proof of completing square method in quadratic equation of right angled triangle.

Now with the help of this proof we are try to understand base and height in each quadent when we are know the area and Sidemeasurement of right angled triangle. In this equation ,value of a is 1 ,that`s mean twice area of right angled triangle is d . Now value of a is not equal to 1, then quadratic equation reference is a $x^2$ - b$x$+ c=0 ,here a≠1 , b= B(ΔPQR)and c =a.c` is constant. So Basic proof of completing square method of right angled triangle explain as below.

$$\left[x - \frac{B(\Delta PQR)}{2}\right]^2 = \frac{[B(\Delta PQR)]^2 - 8.A(\Delta PQR)}{4}$$

A(ΔPQR) =A(ΔPQ`R`) . a^2

. . .Proof of Coefficient relation of right angled triangle

$$\left[x - \frac{B(\Delta PQR)}{2}\right]^2 = \frac{[B(\Delta PQR)]^2 - 8.\ a^2.\ A(\Delta PQ`R`)}{4}$$

Now we are find coefficient relation in completing square method in quadratic equation of right angled triangle.

III) Concept of formula method of right angled triangle

Formula method of right angled triangle is a one of a great concept concept ,to find base and height of right angled triangle when area and sidemeasurement of right angled triangle is known .

So we are proof formula method of right angled triangle .This method through base and height explained as below-

3.5) Proof of formula method of right angled triangle :-

Known information :-In, ΔPQR ,

Sidemeasurement of ΔPQR = B(ΔPQR)

Area of ΔPQR = A(ΔPQR)

a =1 ,b =B(ΔPQR), d = 2.A(ΔPQR)

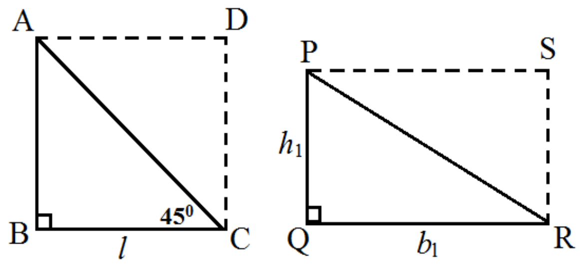

Figure VI : Formula method of right angled triangle

To prove: - $x = \frac{B(\Delta PQR) \pm \sqrt{B(\Delta PQR)^2 - 8\,A(\Delta PQR)}}{2a}$

Proof :- In ΔPQR ,

$ax^2 - bx + c = 0$

$ax^2 - B(\Delta PQR)x + 2.\,a.A(\Delta PQ`R`) = 0$

$ax^2 - B(\Delta PQR)x = -\ 2.\,a..A(\Delta PQ`R`)$ …(i)

Divided both sides of equation (i) by a …(a ≠1)

$x^2 - \frac{A(PQRS)}{a}x = -\frac{2.a..A(\Delta PQ`R`)}{a}$ …(ii)

Third term $= [\frac{1}{2}$ x coifficient $x\ ]^2$

$= \left[\frac{1}{2}\mathrm{x} \quad -\frac{B(\Delta PQR)}{a}\right]^2$

$= \frac{B(PQRS)^2}{4a^2}$

Both sides of equation (i) added by $\frac{B(\Delta PQR)^2}{4a^2}$

$x^2 - \frac{B(\Delta PQR)}{a}x + \frac{B(\Delta PQR)^2}{4a^2} = \frac{B(\Delta PQR)^2}{4a^2} - \frac{2.a.A(\Delta PQ`R`)}{a}$

$x^2 - \frac{2.B(\Delta PQR)}{2a}x + \frac{B(\Delta PQR)^2}{4a^2} = \frac{B(\Delta PQR)^2}{4a^2} - \frac{8.a^2.A(\Delta PQ`R`)}{4a^2}$

$[x - \frac{B(\Delta PQR)}{2a}]^2 = \frac{B(\Delta PQR)^2 - 8.a^2.A(\Delta PQ`R`)}{4a^2}$

$[x - \frac{B(\Delta PQR)}{2a}] = \pm\frac{\sqrt{B(\Delta PQR)^2 - 8.a^2.A(\Delta PQ`R`)}}{2a}$

... A(ΔPQR) = a^2 . A(ΔPQ\`R\`)

$$x = \frac{B(\Delta PQR)}{2a} \pm \frac{\sqrt{B(\Delta PQR)^2 - 8 .\ A(\Delta PQR)}}{2a}$$

$$x = \frac{B(\Delta PQR) \pm \sqrt{B(\Delta PQR)^2 - 8\, A(\Delta PQR)}}{2a}$$

Hence we are proof that formula method of right angled triangle
Base and height of right angled triangle outcomes form quadratic equation of right angled triangle explaine as bellow

$$b_1 = \frac{B(\Delta PQR) + \sqrt{B(\Delta PQR)^2 - 8\, A(\Delta PQR)}}{2a}$$

$$h_1 = \frac{B(\Delta PQR) - \sqrt{B(\Delta PQR)^2 - 8\, A(\Delta PQR)}}{2a}$$

This method explain that, we are know area and sidemeasurement of right angled triangle then we can be find base and height of right angled triangle with the help of this quadratic equation.
But here value of a is 1 ,that\`s means area of right angled triangle is c But when a≠ 1 then formula method explained as below.

$$x = \frac{B(\Delta PQR) \pm \sqrt{B(\Delta PQR)^2 - 8\, A(\Delta PQR)}}{2a}$$

A(ΔPQR) = a^2 x A(ΔPQ\`R\`)

$$x = \frac{B(\Delta PQR) \pm \sqrt{B(\Delta PQR)^2 - 8 .a^2.A(\Delta PQ`R`)}}{2a}$$

This formula is used to find base and height of right angled triangle so that this formula is also known as proof of coefficient relation in formula method of right angled triangle.As formula method of right angled triangle outcomes base and height is bellow.

$$b_1 = \frac{B(\Delta PQR) + \sqrt{B(\Delta PQR)^2 - 8\, A(\Delta PQR)}}{2a}$$

$$h_1 = \frac{B(\Delta PQR) - \sqrt{B(\Delta PQR)^2 - 8\, A(\Delta PQR)}}{2a}$$

3.6) Nature of base and height of right angled triangles quadratic equation

The value of base and height in quadratic equation of right angled triangle, decided with the value of $\sqrt{B(\Delta PQR)^2 - 8. A(\Delta PQR)}$ and that’s conditions explained as below.

I) When value of $\sqrt{b^2 - 4d}$ in formula method of quadratic equation of right angled triangle is greater than zero i.e. $\sqrt{b^2 - 4.d}$ >0 then, value of base and height of right angled triangle is real but un-equal.

II) When value of $\sqrt{b^2 - 4.d}$ in formula method of quadratic equation of right angled triangle is equal to zero i.e. $\sqrt{b^2 - 4.d} = 0$, then, value of base and height of right angled triangle is real and equal

III) When value of $\sqrt{b^2 - 4.d}$ in formula method of quadratic equation of right angled triangle is less than zero i.e. $\sqrt{b^2 - 4.d} < 0$ then, value of base and height of right angled triangle is not real

3.7) Relation between the base & height,and area & sidemeasurement of right angled triangle quadratic equation

Here base and height of quadratic equation of right angled triangle is b_1 and h_1 .and with the help of that value we can be find sidemeasurement and area of right angled triangle .which explained as bellow.

$a\,x^2$ - bx+ c=0

$a\,x^2$ - B(ΔPQR)x+ 2.a. A(ΔPQ`R`)=0

We are know that factors of above quadratic equation i.e. Base (b_1) and height (h_1) ,Form the formula method of quadratic equation of right angled triangle we can written as

$$b_1 = \frac{B(\Delta PQR)+\sqrt{B(\Delta PQR)^2-8\,A(\Delta PQR)}}{2a}$$

and

$$h_1 = \frac{B(\Delta PQR)-\sqrt{B(\Delta PQR)^2-8\,A(\Delta PQR)}}{2a}$$

Now we are explained area and Sidemeasurement of right angled triangle with the help of base and height of right angled triangle

$$(b_1+h_1)=\frac{B(\Delta PQR)+\sqrt{B(\Delta PQR)^2-8\,A(\Delta PQR)}}{2a} + \frac{B(\Delta PQR)-\sqrt{B(\Delta PQR)^2-8\,A(\Delta PQR)}}{2a}$$

$$(b_1+ h_1)= [\frac{B(\Delta PQR)}{2a} + \frac{B(\Delta PQR)}{2a}]$$

$$(b_1+ h_1)= [\frac{2.B(\Delta PQR)}{2a}]$$

i.e. Sidemeasurement of right angled triangle is $(b_1+ h_1)= [\frac{B(\Delta PQR)}{a}]$ = h/a … a=1

so we can be witten as

B(ΔPQR) = Coefficient of '–x`/Coefficient of '$x^2$`

$$(b_1 . h_1) = \frac{B(\Delta PQR)+\sqrt{B(\Delta PQR)^2-8\,A(\Delta PQR)}}{2a} \quad x \quad \frac{B(\Delta PQR)-\sqrt{B(\Delta PQR)^2-8\,A(\Delta PQR)}}{2a}$$

$$(b_1 . h_1) = [\frac{B(\Delta PQR)}{2a}]^2 - [\frac{\sqrt{B(\Delta PQR)^2-8\,A(\Delta PQR)}}{2a}]^2$$

$$(b_1 . h_1) = \frac{B(\Delta PQR)^2}{4a^2} - \frac{B(\Delta PQR)^2+8\,A(\Delta PQR)}{4a^2}$$

$$(b_1 . h_1) = \frac{B(\Delta PQR)^2 - B(\Delta PQR)^2+8\,A(\Delta PQR)}{4a^2}$$

$$(b_1 . h_1) = \frac{8\,A(\Delta PQR)}{4a^2}$$

$$(b_1 . h_1) = \frac{2\,A(\Delta PQR)}{a^2}$$

i.e. Area of right angled triangle is $(b_1 . h_1) = \frac{2.A(\Delta PQR)}{a^2}$

so we can be witten as

d = 2.A(ΔPQR) = Constant / Coefficient of 'x^2'

IV. Conclution

"Concept Of Quadratic Equation Of Right Angled Triangle To Relation All Mathematics Method" this research article conclude that relation of area and Sidemeasurement of right angled triangle with the form of quadratic equation .

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