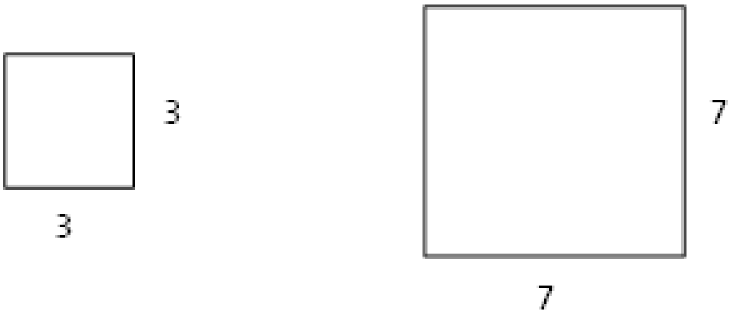


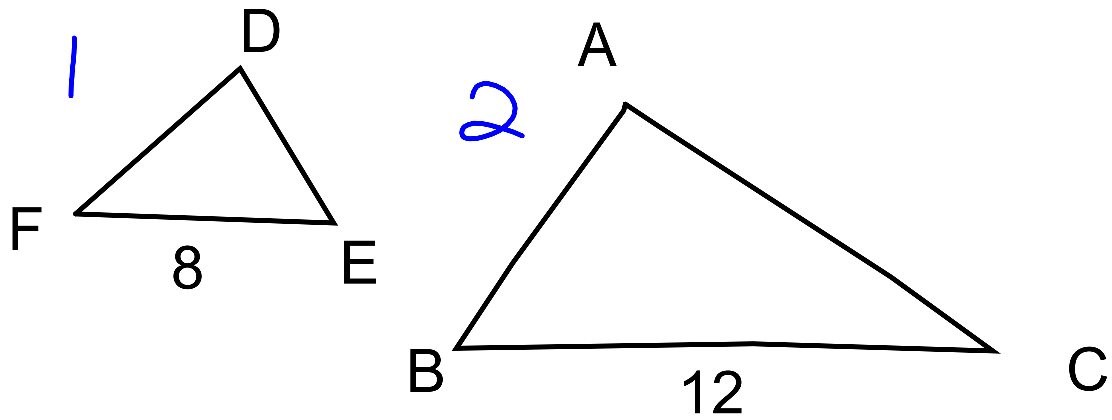
1. Find the ratio of the sides of the squares (smaller to larger) 3:7
2. Find the ratio of the perimeters of the squares (smaller to larger) 3:7 12:28
3. Find the ratio of the areas of the squares (smaller to larger) 9:49
4. What do you notice?

Index Card

Similar-Figures Theorem: If two figures are similar, then the ratio of their areas equals the square of the ratio of corresponding segments.

$$\frac{A_1}{A_2} = \left(\frac{s_1}{s_2}\right)^2$$

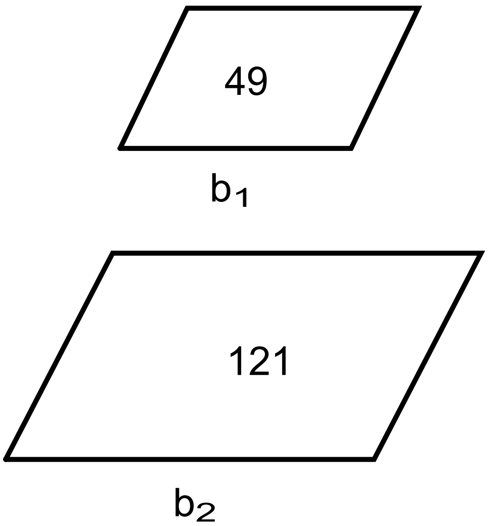
Where A_1 and A_2 are areas and s_1 and s_2 are measures of corresponding sides.



Triangles ABC and DEF are similar.
Find the ratio of their areas.

$$\frac{A_1}{A_2} = \left(\frac{8}{12}\right)^2 = \frac{64}{144} \quad \frac{4}{9}$$

If the ratio of the areas of two similar parallelograms is 49:121, find the ratio of their bases.

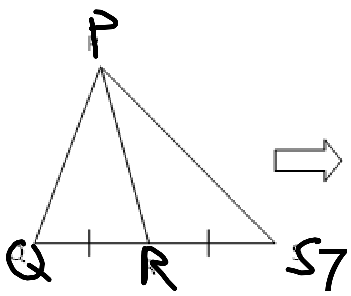


$$\frac{7}{11} = \frac{\sqrt{49}}{\sqrt{121}} = \left(\frac{S_1}{S_2}\right.$$

Feb 8-9:52 AM

Index Card

Theorem: A median of a triangle divides the triangle into two triangles with equal areas.



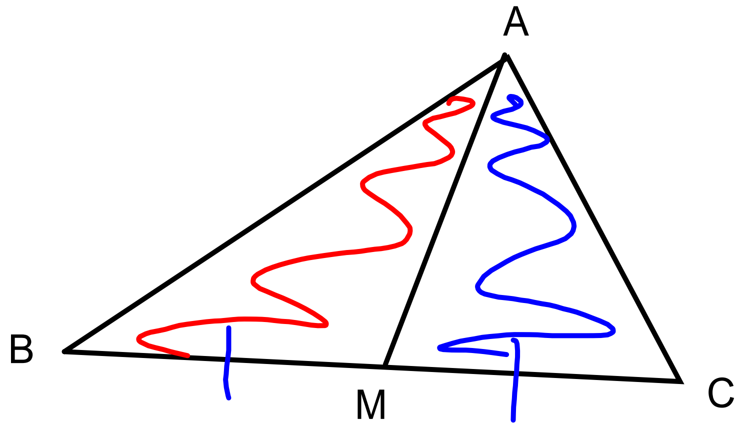
$A_{\triangle PQR} = A_{\triangle PRS}$

Feb 8-9:47 AM

7

AM is a median of triangle ABC.

Find the ratio of the area of triangle ABM to the area of triangle ACM



1 : 1

What formulas do you know to find the area of a triangle?

1) $\frac{1}{2}bh$ 3) $\frac{1}{2}ab\sin C$

2) $\frac{1}{2}ap$

When is each of the above formulas used?

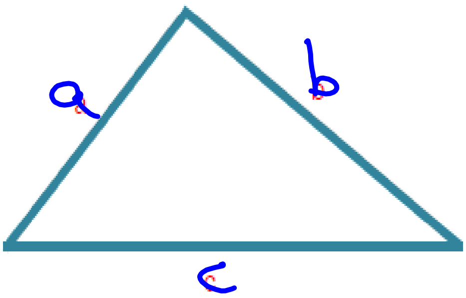
What if we have a different situation entirely?...

Feb 9-2:43 PM

Theorem **(Hero's Formula)** $A_\Delta = \sqrt{s(s-a)(s-b)(s-c)}$,

where a, b, and c are the lengths of the sides of the triangle

and s = semiperimeter = $\frac{a+b+c}{2}$



$A = \sqrt{s(s-a)(s-b)(s-c)}$

Can be used to find the area of a triangle when given SSS!

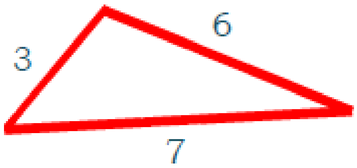
find the area of a triangle with sides 3, 6, and 7.

$\sqrt{8(5)(2)(1)}$

$\sqrt{80}$

$\sqrt{16}\sqrt{5}$

$4\sqrt{5}$



Step 1: Find the perimeter → 16

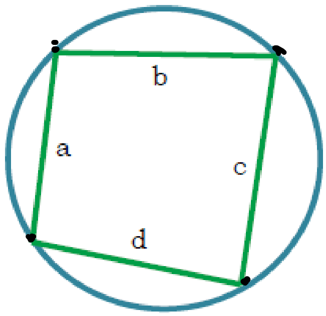
Step 2: Find the semiperimeter → 8

Step 3: Replace variables in Hero's formula using corresponding values and evaluate!

Area of Cyclic Quadrilaterals

A Hindu mathematician named **Brahmagupta** recorded a formula for deriving the area of an ***inscribed quadrilateral*** in about 628 A.D. Brahmagupta's formula can only be applied to quadrilaterals that are ***cyclic quadrilaterals***, meaning quadrilaterals that can be inscribed in circles.

Theorem **(Brahmagupta's formula)**

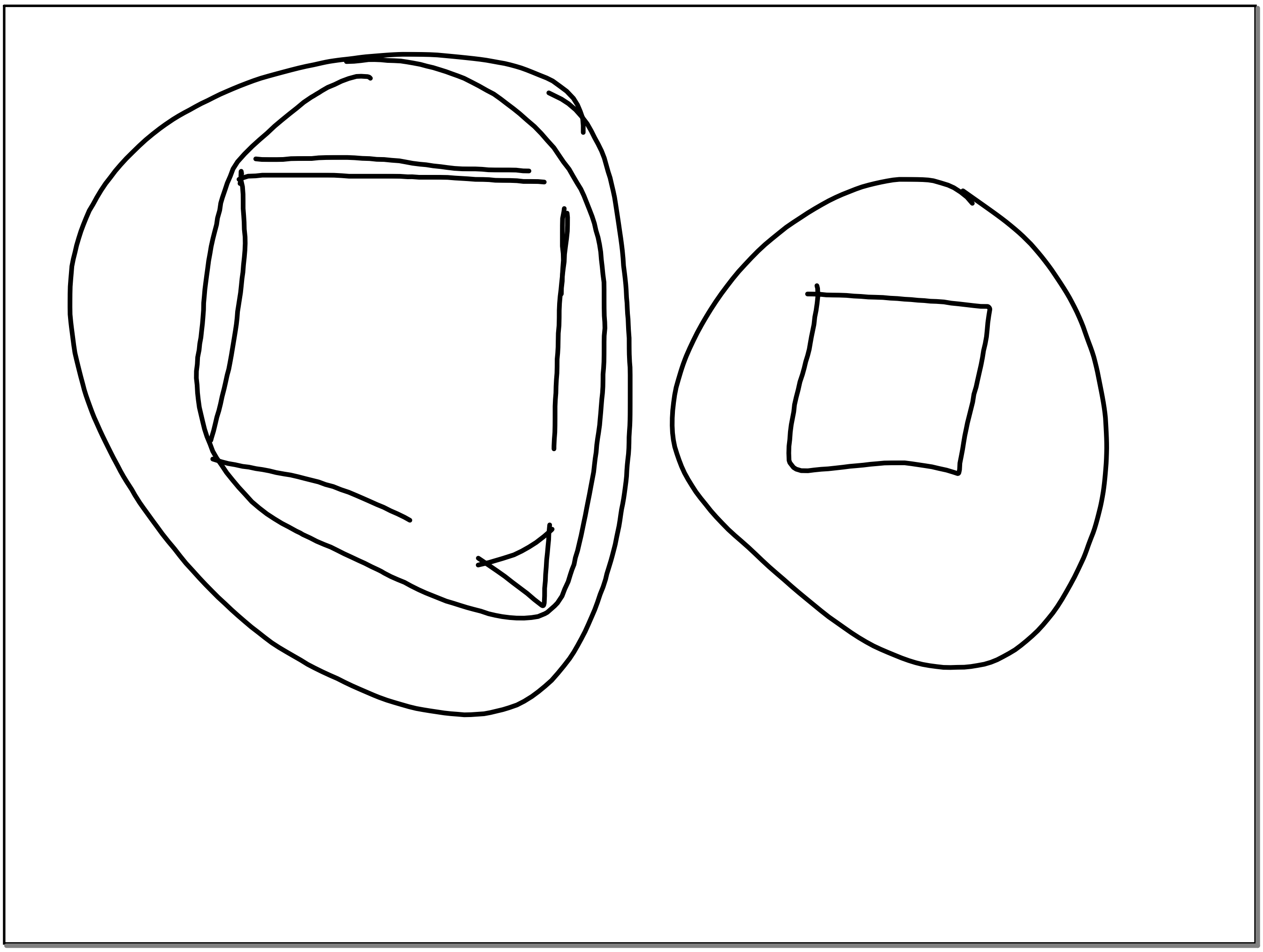


$$A_{cyclic\ quad} = \sqrt{(s-a)(s-b)(s-c)(s-d)},$$

where a, b, c, and d are the sides of the quadrilateral

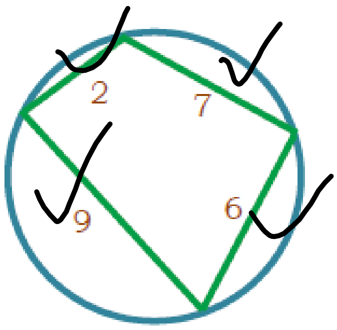
and s = semiperimeter = $\frac{a+b+c+d}{2}$

☆inscribed Quadrilateral☆



Feb 23-2:33 PM

find the area of a cyclic quadrilateral



$$\sqrt{10 \cdot 5 \cdot 6 \cdot 3}$$

$$\sqrt{900}$$

$$\boxed{30}$$

Step 1: Find the perimeter → 24

Step 2: Find the semiperimeter → 12

Step 3: Substitute corresponding values into Brahmagupta's formula and evaluate.

Classwork

Stations

Homework

43 p. 546 #4 - 8, 11 - 13, 15, 16
44 p. 551 #6, 9

Feb 21-4:48 PM