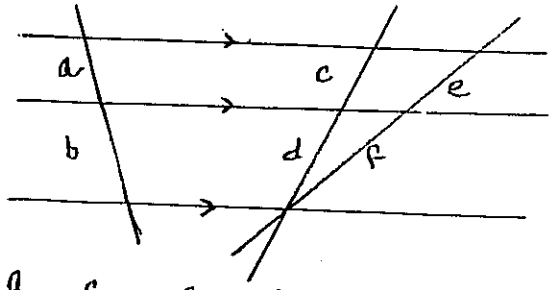


Meet 2: Familiar Geometric Figures, Congruence, Similarity

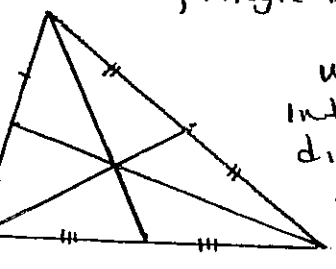
Topics: Ratio and Proportion

Segments intercepted by parallel lines.

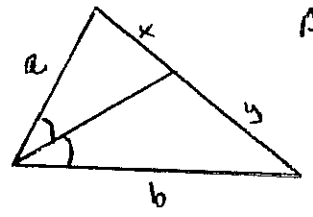


$$\frac{a}{b} = \frac{c}{d}, \frac{a}{c} = \frac{b}{d}, \frac{a}{d} = \frac{b}{c}$$

Medians, Angle Bisectors, Altitudes



When medians intersect, they are divided into segments in the ratio of $\frac{2}{3}$ to $\frac{1}{3}$.



Angle Bisector

$$\frac{a}{b} = \frac{x}{y}$$

Pythagorean Theorem and Pythagorean Triples.

- Common triples:
- (3, 4, 5); (6, 8, 10); (5, 12, 13);
 - (8, 15, 17); (7, 24, 25)

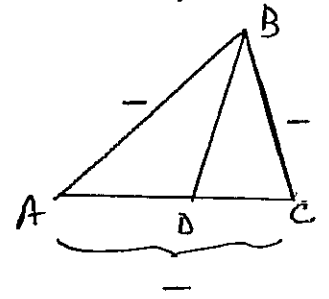
Right triangles, $30^\circ, 60^\circ, 90^\circ$; $45^\circ, 45^\circ, 90^\circ$

Equilateral, Isosceles triangles

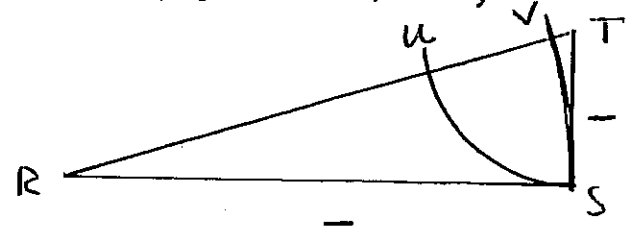
Problems: (From 1985)

1. What is the area of an equilateral triangle having sides of length 2?

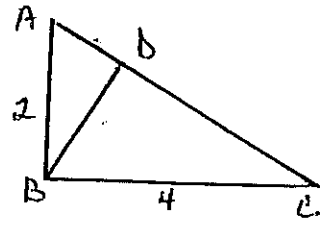
2. $\triangle ABC$ has sides $a=4, b=5, c=6$. The angle bisector at B cuts \overline{AC} at D. Find the length of \overline{CD} .



3. Refer to $\triangle RST$. Using a compass centered at R and radius RS, \overline{SU} is drawn. Similarly, with center T and radius TS, \overline{SU} is drawn. Find the length of \overline{UV} , given $r=7, s=25, t=24$.

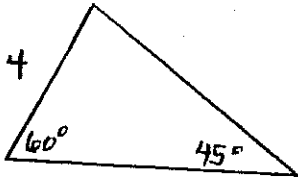


4. Right $\triangle ABC$ has legs $c=2, a=4$. The altitude from B meets \overline{AC} at D. Find the area of $\triangle ABD$.

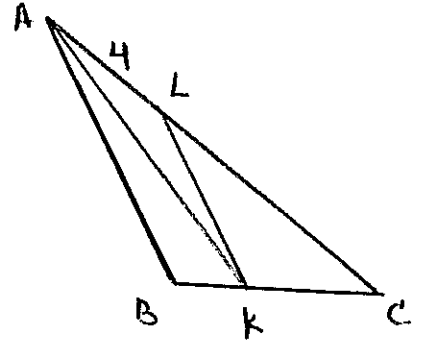


More Problems:

5. Find the area of this triangle.

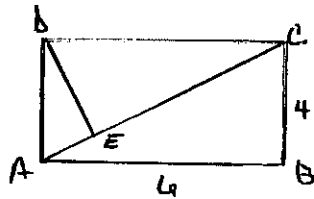


6. In $\triangle ABC$, the bisector of $\angle A$ meets \overline{BC} at K where K is $\frac{2}{5}$ of the way from B to C . A line through K , parallel to \overline{AB} , meets \overline{AC} at L . If $AL=1$, how long is AB ?



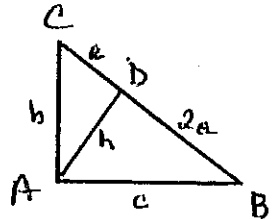
7. The altitude of an equilateral triangle is $\frac{1}{\sqrt{3}}$. What is its perimeter?

8. In Rect ABCD, $AB=6$ and $BC=4$. A perpendicular \overline{DE} has been dropped from D to the diagonal \overline{AC} . Express \overline{DE} in rationalized (simplified) form.



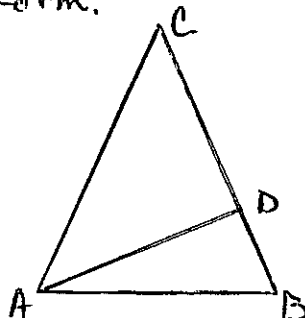
10. In right $\triangle ABC$, a perpendicular has been drawn from A to the hypotenuse. The lengths are $AC=b$, $AB=c$, $CD=a$, $DB=2a$, and $AD=h$.

a) Express h in terms of a .



b) Express c in terms of a .

9. In isosceles $\triangle ABC$ with base $AB=4$, the legs have length 6 . A perpendicular \overline{AD} is drawn from A to the opposite leg. Find AD , in simplified form.



- Answers:
1. $\sqrt{3}$
 2. 2
 3. 6
 4. $\frac{4}{5}$
 5. $6+2\sqrt{3}$
 6. $6\frac{2}{3}$
 7. 2
 8. $\frac{12\sqrt{13}}{13}$
 9. $\frac{8\sqrt{2}}{3}$
 10. a) $\sqrt{2} \cdot a$
b) $\sqrt{6} \cdot a$