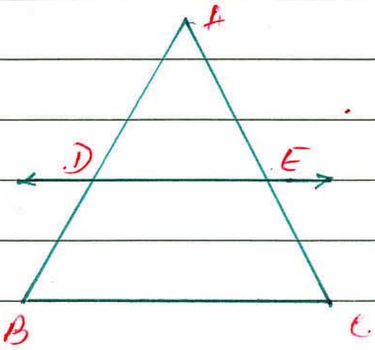
Things to Remember
Chapter-6 (Similar Triangles) X

1) Theorem 6·1 (Basic Proportionality Theorem)

"If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio"



$DE \parallel BC$ then $\dfrac{AD}{DB} = \dfrac{AE}{EC}$

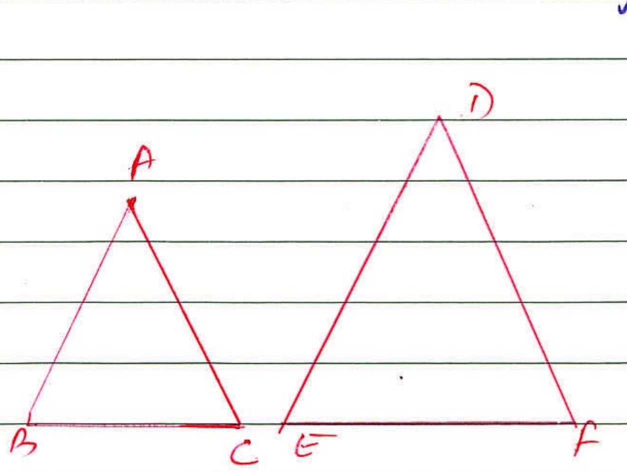
2) Theorem 6·2 (Converse of Basic Proportionality Theorem)

"If a line divides any two sides of a triangle in the same ratio, then the line is parallel to the third side"

3) Theorem 6·3 (AAA - Similarity Criterion)

"If in two triangles, corresponding angles are equal, then their corresponding sides are in the same ratio (or proportion) and hence the two triangles are similar."

If $\angle A = \angle D$
$\angle B = \angle E$
$\angle C = \angle F$
then, $\dfrac{AB}{DE} = \dfrac{BC}{EF} = \dfrac{AC}{DF}$



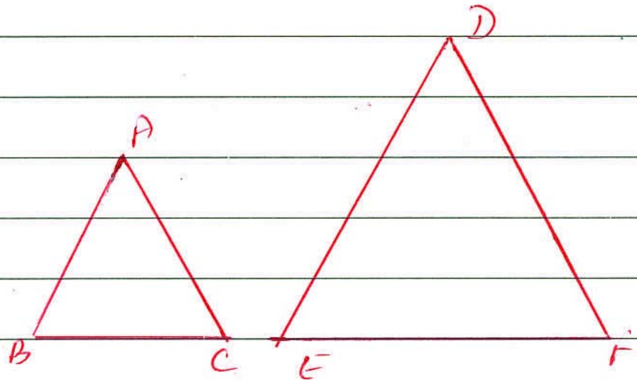
(4) If two angles of one triangle are respectively equal to two angles of another triangle, then the two triangles are similar. (AA - Similarity Criterion)

(5) Theorem 6.4 (SSS Similarity Criterion)

"If in two triangles, sides of one triangle are proportional to (i.e. in the same ratio of) the sides of the other triangle, then their corresponding angles are equal and hence the two triangles are similar"

If $\frac{AB}{DE} = \frac{AC}{DF} = \frac{BC}{EF}$

then $\Delta ABC \sim \Delta DEF$



(6) Theorem 6.5 (SAS Similarity Criterion)

"If one angle of a triangle is equal to one angle of the other triangle and the sides including these angles are proportional, then the two triangles are similar".

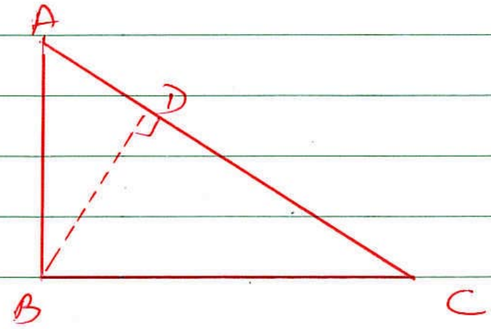
7) Theorem 6.6 (Areas of Similar Triangles)

"The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides."

$$\frac{ar(\Delta ABC)}{ar(\Delta PQR)} = \left(\frac{AB}{PQ}\right)^2 = \left(\frac{BC}{QR}\right)^2 = \left(\frac{AC}{PR}\right)^2$$

8) Theorem 6.7 (Phythagoras Theorem)

"If a perpendiculer is drawn from the vertex of right angle of a triangle to the hypotenuse then triangle on both sides of the perpendiculer are similar to the whole triangle and to each other."



$BD \perp AC$

$\Delta ABD \sim \Delta BDC$

(or) $\Delta ABD \sim \Delta ABC$

$\Delta BDC \sim \Delta ABC$

9) Theorem 6.8 – "In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two side.

In ΔABC, right angled at B, $AC^2 = AB^2 + BC^2$

(This theorem is also known as Baudhayan Theorem)

10) Theorem 6.9 – "In a triangle, if a square of one side is equal to the sum of the squares of the other two sides, then the angle opposite the first side is a right angle."