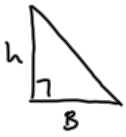
Coordinate Geometry: The Line

chapter 1

Section 1.2 The area of a triangle

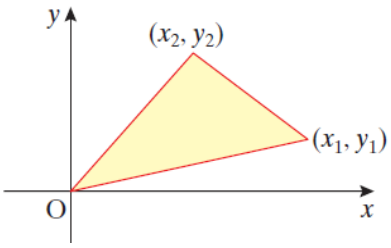
$A = \frac{Bh}{2}$



PROJECT MATHS – STRAND 2
Text & Tests 4
LEAVING CERTIFICATE HIGHER LEVEL

The area of the triangle with vertices $(0, 0)$, (x_1, y_1) and (x_2, y_2) is

$$\text{Area} = \frac{1}{2}|x_1 y_2 - x_2 y_1|$$



Example 1

Find the area of the triangle with vertices $(0, 0)$, $(-2, 1)$ and $(3, 4)$.

$A = \frac{1}{2}|x_1 y_2 - x_2 y_1|$

$A = \frac{1}{2}|(-2)(4) - (3)(1)|$

$= \frac{1}{2}|-8 - 3|$

$= \frac{1}{2}|-11|$

$= \frac{11}{2}$ units^2

Example 2

Find the area of the triangle with vertices $(1, 5), (-3, 1)$ and $(3, -5)$.

Plan: Translate Δ so a vertex is $(0,0)$ then use formula.

$A_{(0,0)} = \frac{1}{2}|x_1y_2 - x_2y_1|$

$(1, 5) \xrightarrow{-1,-5} (0, 0)$

$(-3, 1) \rightarrow (-4, -4)$ (x_1, y_1)

$(3, -5) \rightarrow (2, -10)$ (x_2, y_2)

$A = \frac{1}{2}|(-4)(-10) - (2)(-4)|$

$= \frac{1}{2}|40 + 8|$

$= \frac{48}{2}$

$= 24$ units^2