## The Line (Q 2, Paper 2)

## Lesson No. 8: Area of a Triangle

## 2007

2 (c) $a(-4,3), b(6,-1)$ and $c(2,7)$ are three points.
(i) Find the area of triangle $a b c$.
(ii) $a b c d$ is a parallelogram in which $[a c]$ is a diagonal. Find the co-ordinates of the point $d$.

## 2006

2 (a) $a(-2,6)$ and $b(4,3)$ are two points.
(i) Plot $a$ and $b$ on a co-ordinate diagram.
(ii) From your diagram, write down the co-ordinates of the point at which the line $a b$ cuts the $y$-axis.
(iii) Find the slope of $a b$.
(iv) Calculate the area of the triangle $a b c$, where the co-ordinates of $c$ are $(1,-3)$.

## 2004

2 (b) $a(-1,-2), b(3,1), c(0,4)$ are three points.
(i) Find the length of $[a b]$.
(ii) Calculate the area of the triangle $a b c$.
(iii) The line $L$ is parallel to $a b$ and passes through the point $c$.

Find the equation of $L$.
(iv) Show that the point $d(-4,1)$ is on $L$.
(v) Investigate whether $a b c d$ is a parallelogram.

## 2002

2 (b) The line $L$ has equation $4 x-5 y=-40$. $a(0,8)$ and $b(-10,0)$ are two points.
(i) Verify that $a$ and $b$ lie on $L$.
(ii) What is the slope of $L$ ?
(iii) The line $K$ is perpendicular to $L$ and it contains $b$. Find the equation of $K$.
(iv) $K$ intersects the $y$-axis at the point $c$. Find the co-ordinates of $c$.
(v) $d$ is another point such that $a b c d$ is a rectangle. Calculate the area of $a b c d$.
(vi) Find the co-ordinates of $d$.

## 2001

2 (b) $a(4,2), b(-2,0)$ and $c(0,4)$ are three points.
(i) Prove that $a c \perp b c$.
(ii) Prove that $|a c|=|b c|$.
(iii) Calculate the area of the triangle bac.
(iv) The diagonals of the square bahg intersect at $c$.

Find the co-ordinates of $h$ and the co-ordinates of $g$.
(v) Find the equation of the line $b c$ and show that $h$ lies on this line.

## 2000

2 (c) (i) The line $L$ has equation $3 x-4 y+20=0$.
$K$ is the line through $p(0,5)$ which is perpendicular to $L$.
Find the equation of $K$.
(ii) $L$ cuts the $x$-axis at the point $t$.
$K$ cuts the $x$-axis at the point $r$.
Calculate the area of the triangle ptr. Give your answer as a fraction.

1997
2 (b) $L$ is the line $x-2 y+2=0$.
$M$ is the line $3 x+y-8=0$.
Find the co-ordinates of $p$, the point of intersection of $L$ and $M$.
$L$ and $M$ cut the $x$-axis at $q$ and $r$, respectively.
Find the area of triangle $p q r$.

## 1996

2 (a) The line $L$ contains the points $p(3,-1)$ and $q(0,2)$.
(i) Find the slope of $L$.
(ii) Find the equation of $L$.
(iii) $L$ intersects the $x$-axis at the point $r$. Find the coordinates of $r$.
(iv) Calculate the ratio

$$
\frac{\text { area of triangle } r p o}{\text { area of triangle } p q o}
$$

where $o$ is the origin.

## Answers

20072
(c) (i) 32
(ii) $d(-8,11)$

20062 (a) (i)

(ii) $(0,5)$
(iii) $-\frac{1}{2}$
(iv) $\frac{45}{2}$

2004
2 (b) (i) 5
(ii) $\frac{21}{2}$
(iii) $3 x-4 y+16=0$
(v) Yes

20022
(b) (ii) $\frac{4}{5}$
(iii) $5 x+4 y+50=0$
(iv) $c\left(0,-\frac{25}{2}\right)$
(v) 205
(vi) $d\left(10,-\frac{41}{2}\right)$

2001
2
(b) (iii) 10
(iv) $g(-4,6), h(2,8)$
(v) $2 x-y+4=0$

20002
(c) (i) $4 x+3 y-15=0$
(ii) $\frac{625}{24}$

19972 (b) $p(2,2), \frac{14}{3}$
19962
(a) (i) -1
(ii) $L: x+y-2=0$
(iii) $r(2,0)$
(iv) $1: 3$

