

# FOCUS B

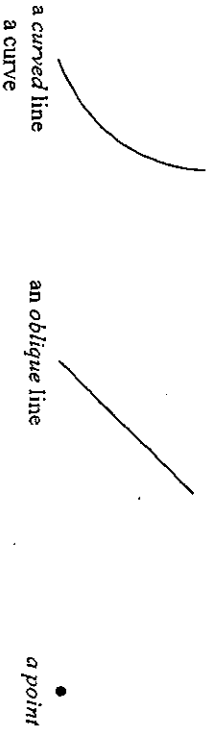
## Geometry

### Fundamental signs:

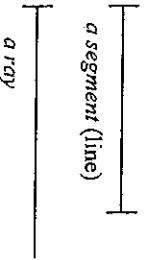
	is parallel
⊥	is perpendicular
△	a triangle
∠	an angle
°	degree
'	minute
"	second

### LINES

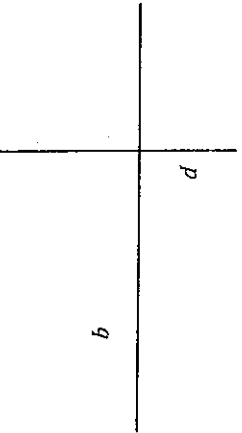
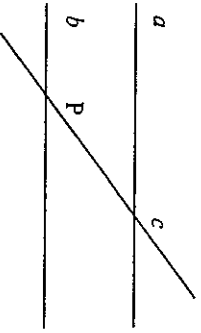
#### 1. Look and read:



a (straight) horizontal line



a (straight) vertical line

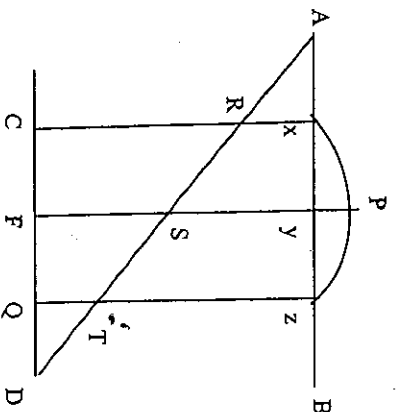


These are *parallel* lines. *a* is parallel to *b*. They are *equidistant*. A straight line drawn across a set of two or more parallel lines is called a *transversal*. Lines *c* and *b* intersect at the point *P*.

These are *perpendicular* (*orthogonal*) lines. *p* is perpendicular to *q*.

#### 2. Look at the figure and say which lines are:

- vertical
- transversal
- parallel
- oblique
- horizontal
- curved
- straight
- perpendicular



#### 3. Using the words you have learned, describe the following capital letters:

Example: H – Letter H has two parallel vertical lines and one horizontal line.

- |      |      |      |      |      |
|------|------|------|------|------|
| a) K | c) M | e) I | g) A | i) Z |
| b) B | d) E | f) L | h) X | j) O |

#### 4. Which word (in capital letters) is being described below?

*First letter*

One full-length perpendicular line is joined at the top and at its centre point by two parallel lines, the former slightly longer than the latter, extending to the right horizontally.

*Second letter*

A symmetrical, wedge-shaped figure: two straight but oblique lines slanting down to the base from a common point at the top; these are bisected by a single horizontal line.

*Third letter*

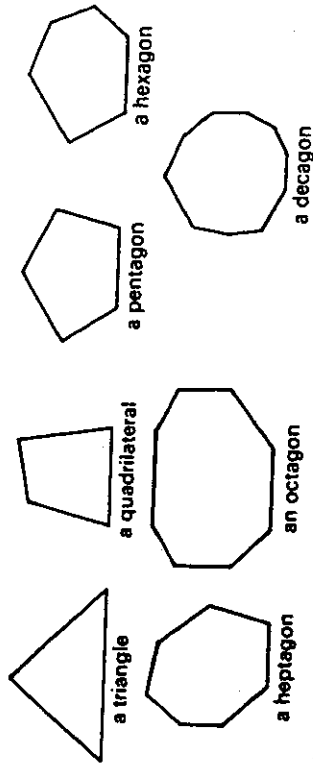
A long vertical line is connected at two points – at the top and halfway down – to a curved, semi-circular line running to the right. From the centre intersection a sloping line drops to the baseline at an angle 45 degrees to the perpendicular; again to the right.

#### 5. Complete the following sentences:

- Lines may be ..... or curved. .... lines may be divided into three groups: vertical, ..... and .....
- Pairs of lines may be divided into two groups: those which ..... and those which are ..... at all points, which are called ..... lines.

5. Look at these figures:

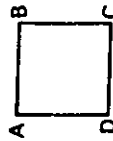
Plane figures



A triangle has three sides and three angles.  
A triangle is a three-sided figure.

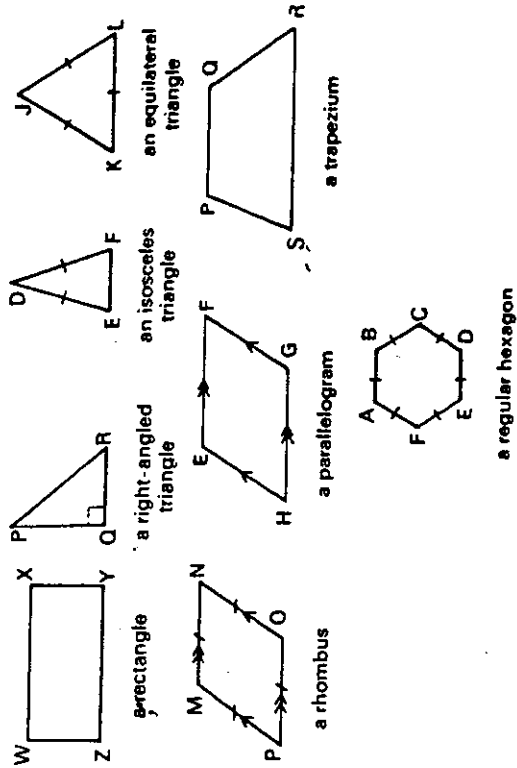
Now make similar statements about the other figures.

6. Look and read:



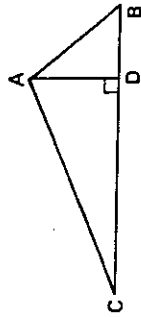
ABCD is a square.  
It is a four-sided figure.  
All its sides are equal.  
All its angles are right angles.  
Opposite sides are parallel.

Now describe these figures:



Section 2 Development

10. Look and read:

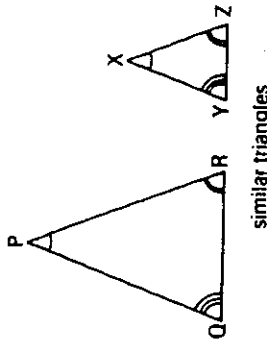
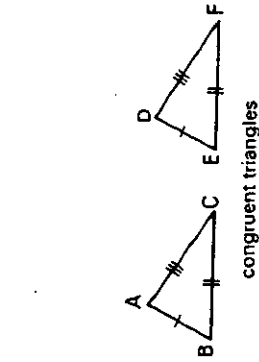


AD is an altitude of the triangle.  
BC is the base.  
What is the area of  $\triangle ABC$ ?

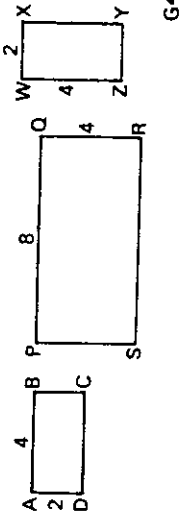
AD is equal to EH and BC is equal to FG.  
The altitudes of the two triangles are equal and so are the bases.  
Therefore the areas are the same.  
 $\triangle ABC$  has the same area as  $\triangle EFG$ .



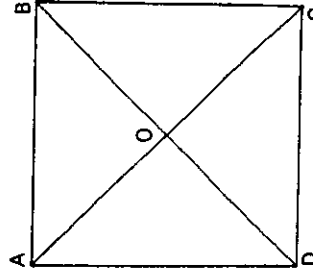
Now describe the following pairs of triangles:



11. Compare these figures, saying whether they are congruent, similar or have the same area:



12. Look and read:



In square ABCD, the diagonals intersect at O.  
 $OA = OC$  and  $OD = OB$ . The diagonals bisect each other.  
 $\angle AOB = 90^\circ$ . The diagonals intersect at right angles.  
 $\angle DAO = \angle BAO$ . The diagonals bisect the angles.

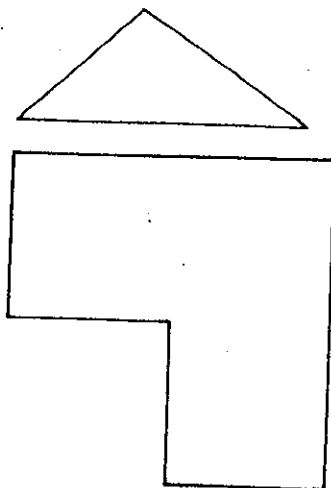
$AC = BD$ . The diagonals are equal.  
 $AB = DC$ . The opposite sides are equal.  
 $AB \parallel DC$ . The opposite sides are parallel.

Now complete these tables:

	Opposite sides equal	Opposite sides parallel	Diagonals bisect each other	Diagonals bisect angles	Diagonals intersect at right angles	Diagonals equal
Square	✓	✓	✓	✓	✓	✓
Rhombus						
Parallelogram						
Trapezium						
Regular hexagon						

	Angles equal	Sides equal	Areas equal
Congruent figures			
Similar figures			

18. PUZZLE



a) Divide this triangle into three figures with equal areas, using two straight lines.

b) Divide this figure into:  
 i) two congruent figures  
 ii) three congruent figures  
 iii) four congruent figures

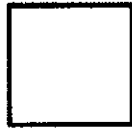
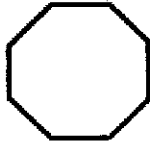
a) equilateral



b) equiangular




c) regular



## Polygons (4:13)

[http://learner.org/vod/vod\\_window.html?pid=1801](http://learner.org/vod/vod_window.html?pid=1801)

Listen to and watch the video and answer questions.

- 1) What was discussed in the previous lesson?.....
- 2) What is the aim of this lesson?.....
- 3) What is a polygon?.....
- 4) What was wrong with the first definition of a polygon?.....
- 5) What does it mean „polygons are closed“?.....
- 6) Why is a circle not a polygon?.....
- 7) What is wrong with two other shapes?.....
- 8) Why is  not a polygon?.....

Look at these pictures and decide whether the shapes are polygons or not. Try to explain why.

