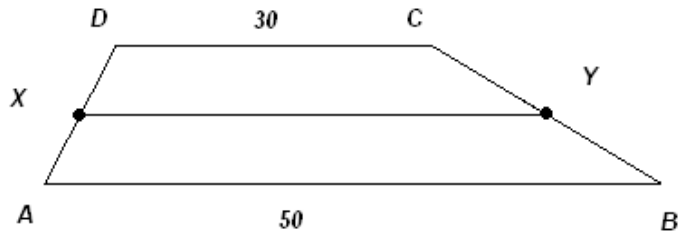
Conditions

ABCD is a trapezium in which AB is parallel to CD, CD=30 cm and AB = 50 cm. if x and y are the respectively the mid points of AD and BC prove that ar (DCXY) =7/9(XYBA)

Solution

Consider a graph:



As X and Y are respectively the mid points of AD and BC, so XY is the midline, and:

$$XY = \frac{AB + CD}{2} = \frac{30 + 50}{2} = 40$$

DCXY and XYBA are also trapeziums.

The area of DCXY is:

$$S_{DCXY} = \frac{DC + XY}{2} h_{DCXY}$$

The area of XYBA is:

$$S_{XYBA} = \frac{AB + XY}{2} h_{XYBA}$$

Note, that:

$$h_{DCXY} = h_{XYBA} = \frac{1}{2} h_{ABCD}$$

The rate of areas of DCXY and XYBA is:

$$\frac{\frac{DC + XY}{2}}{\frac{AB + XY}{2}} = \frac{DC + XY}{AB + XY} = \frac{30 + 40}{50 + 40} = \frac{70}{90} = \frac{7}{9}$$

Q.E.D.