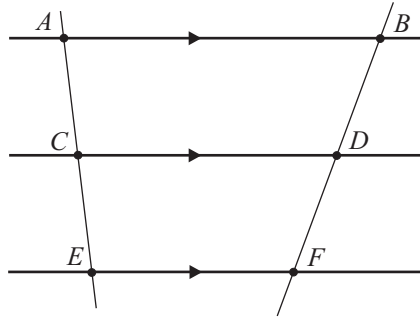


## SAMPLE PAPER 3: PAPER 2

### QUESTION 6 (25 MARKS)

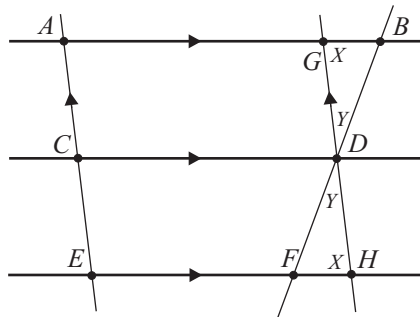
#### Question 6 (a)

**GIVEN:** Three parallel lines  $AB$ ,  $CD$  and  $EF$  such that  $C$  is on  $AE$  and  $D$  is on  $BF$  with  $|AC| = |CE|$ .



**TO PROVE:**  $|BD| = |DF|$ .

**CONSTRUCTION:** Draw a line  $GH$  through  $D$  parallel to  $AE$  such that  $G$  is on  $AB$  and  $H$  is on  $EF$ .



**PROOF:**  $ACDG$  is a parallelogram  $\Rightarrow |AC| = |GD| = |CE|$

$CEHD$  is a parallelogram  $\Rightarrow |CE| = |DH|$

$\therefore |GD| = |DH|$

Now triangle  $GDB$  and triangle  $FDH$  are congruent (**ASA**) because:

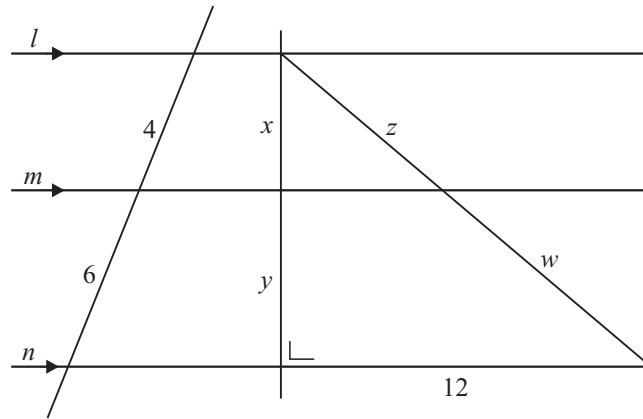
$|\angle BGD| = |\angle FHD| = X$  [Alternate angles]

$|\angle GDB| = |\angle FDH| = Y$  [Vertically opposite angles]

$|GD| = |DH|$  [Already proved]

$\therefore |BD| = |DF|$

Question 6 (b)



$$x + y = 5 \Rightarrow y = 5 - x$$

$$\frac{x}{4} = \frac{y}{6} \Rightarrow x = \frac{4y}{6} = \frac{2y}{3} = \frac{2(5-x)}{3}$$

$$\therefore 3x = 10 - 2x$$

$$5x = 10$$

$$\therefore x = 2, y = 3$$

$$z + w = 13 \text{ (Pythagoras)} \Rightarrow z = 13 - w$$

$$\frac{x}{y} = \frac{z}{w}$$

$$\frac{2}{3} = \frac{13-w}{w} \Rightarrow 2w = 39 - 3w \Rightarrow 5w = 39$$

$$\therefore w = \frac{39}{5}, z = \frac{26}{5}$$