

## Worksheet 3

- 1) Explain why the slope of a perpendicular line is  $-\frac{1}{m}$  (use book)
- 2) Let  $A = (1, 7)$ ,  $B = (2, 3)$  and  $C = (5, 4)$  be the vertices of the triangle  $\triangle ABC$ .

Let  $H_A$  be the line through  $A$  perpendicular to  $BC$

Let  $H_B$  ———  $u$  ———  $B$  ———  $u$  ———  $AC$

Let  $H_C$  ———  $u$  ———  $C$  ———  $u$  ———  $AB$

a) Find the equations for  $H_A$ ,  $H_B$  and  $H_C$

b) Find the points of intersection of  $H_A$  and  $H_B$ ,  $H_B$  and  $H_C$ ,  $H_C$  and  $H_A$  respectively.

c) is your result from b) a coincidence?

3) If  $f: X \rightarrow Y$  and  $g: Y \rightarrow X$  are two functions

st  $g \circ f = I$ , does it follow that

- 1)  $f$  is surjective
- 2)  $f$  is injective
- 3)  $g$  is surjective
- 4)  $g$  is injective

Justify your answer!