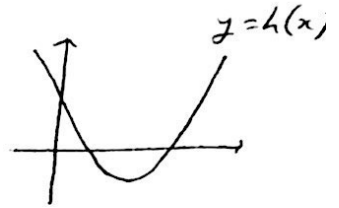
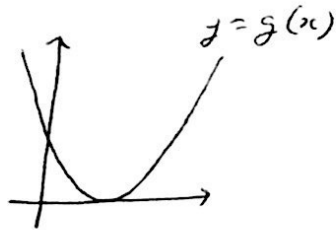
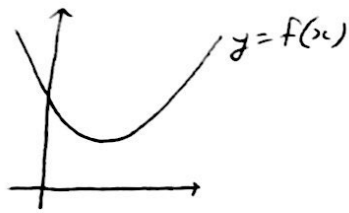


ALGEBRA HW ③

- ① (i) The graphs of three quadratic functions, f , g and h , are shown.



In each case, state the nature of the roots of the function.

- (ii) The equation $kx^2 + (1-k)x + k = 0$ has equal real roots. Find the possible values of k .

$$\left[\begin{array}{l} k = \frac{1}{3} \text{ or} \\ k = -1 \end{array} \right]$$

- ② Simplify fully

$$\frac{x^2 + 4}{x^2 - 4} - \frac{x}{x + 2}$$

$$\left[\frac{2}{x-2} \right]$$

- ③ Two of the roots of the equation $ax^3 + bx^2 + cx + d = 0$

are p and $-p$.

Show that $bc = ad$.

HINTS

- ① (i) Pick from : 2 real & different
2 real same
not real

(ii) Equal roots $\Rightarrow b^2 - 4ac = 0$ in the quadratic formula.

② common denominator etc.

③ p and $-p$ roots

$\therefore (x-p)$ and $(x+p)$ factors

$$\therefore (x-p)(x+p)(\text{SNFF}) = ax^3 + bx^2 + cx + d$$

$$\therefore (x^2 - p^2)(\text{SNFF}) = ax^3 + bx^2 + cx + d$$

work out this bracket

Multiply out LHS.

Compare coefficients between LHS and RHS.