

## Sum and Product of Roots Worksheet

- 1) Determine the value of  $\frac{1}{\alpha} + \frac{1}{\beta}$  for the following equations that have roots  $\alpha$  and  $\beta$
- a)  $x^2 + 12x + 32 = 0$
  - b)  $28x^2 + x - 2 = 0$
  - c)  $5x^2 - 15x + 10 = 0$  (12 marks)
- 2) Calculate the value of  $\alpha^2 + \beta^2$  for the following equations that have roots  $\alpha$  and  $\beta$
- a)  $x^2 - 4x + 6 = 0$
  - b)  $2x^2 - 5x + 2 = 0$
  - c)  $x^2 - x - 2 =$  (15 marks)
- 3) Determine the value of  $\frac{1}{\alpha^2} + \frac{1}{\beta^2}$  for the following equations that have roots  $\alpha$  and  $\beta$
- a)  $2x^2 - 5x + 3 = 0$
  - b)  $x^2 + 3x + 2 = 0$
  - c)  $6x^2 - 13x - 5 = 0$  (12 marks)
- 4) The equation  $3x^2 - 6x - 4 = 0$  has roots  $\alpha$  and  $\beta$ . Find the value of  $\frac{1}{\alpha} + \frac{1}{\beta}$ . (4 marks)
- 5) Given that  $f(x) = -2x^2 - 12x - 9$
- a) Express  $f(x)$  in the form  $k + a(x + h)^2$ , where a, h and k are integers to be determined. (3 marks)
  - b) State the maximum or minimum value of  $f(x)$ . (1 mark)
  - c) Determine the value of x for which  $f(x)$  is a minimum. (1 mark)