1.3 Further Algebra and Roots: 10-minute Pack

EDEXCEL 9FM0 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 The quadratic equation $3x^2 - 7x + 2 = 0$ has roots α and β.

(a) State the value of $\alpha + \beta$ and the value of $\alpha*\beta$. **(2)**

(b) Find the value of $\alpha^2 + \beta^2$. **(3)**

(c) Find, in the form $ay^2 + by + c = 0$ with integer coefficients, the equation whose roots are $2*\alpha + 1$ and $2*\beta + 1$. **(4)**

(Total for Question 1 is 9 marks)

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Mark scheme · 1.3 Further Algebra and Roots: 10-minute Pack

Question 1

(a) $\alpha + \beta = 7/3$ oe	**B1**
(a) $\alpha*\beta = 2/3$ oe	**B1**
(a) Answer: $\alpha + \beta = 7/3$, $\alpha*\beta = 2/3$	
(b) using $\alpha^2+\beta^2 = (\alpha+\beta)^2 - 2*\alpha*\beta$	**M1**
(b) correct substitution $(7/3)^2 - 2(2/3)$	**A1**
(b) $\alpha^2+\beta^2 = 37/9$ oe cao	**A1**
(b) Answer: $\alpha^2 + \beta^2 = 37/9$	
(c) letting $y = 2x+1$ so $x = (y-1)/2$	**M1**
(c) substituting $x = (y-1)/2$ into $3x^2-7x+2=0$	**M1**
(c) multiplying through by 4 and collecting terms	**dM1**
(c) $3y^2 - 20y + 25 = 0$ cao	**A1**
(c) Answer: $3y^2 - 20y + 25 = 0$	

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