HIGHER

7.5 Factorising Harder Quadratics: 30-minute Pack

EDEXCEL 1MA1 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Factorise fully $12x^2 + 58x + 70$

(Total for Question 1 is 3 marks)

2 Solve $6x^2 + 19x + 10 = 0$

(Total for Question 2 is 3 marks)

3 Factorise $2x^2 + 3x - 14$

(Total for Question 3 is 2 marks)

4 Solve $4x^2 + 3x = 7$

(Total for Question 4 is 4 marks)

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5 Simplify fully $(x^2 - 4) / (x^2 + 5x + 6)$

(Total for Question 5 is 4 marks)

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6 Factorise fully $3x^2 + 6x - 45$

(Total for Question 6 is 3 marks)

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7 x and y are positive integers such that $x^2 - y^2 = 45$ and $x - y = 5$. Find the values of x and y.

(Total for Question 7 is 4 marks)

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Mark scheme · 7.5 Factorising Harder Quadratics: 30-minute Pack

Question 1

takes out common factor 2	**M1**
factorises the quadratic	**M1**
$2(2x + 5)(3x + 7)$	**A1**

Answer: $2(2x + 5)(3x + 7)$

Question 2

factorises correctly	**M1**
one correct solution	**A1**
$x = -5/2$ or $x = -2/3$	**A1**

Answer: $x = -5/2$ or $x = -2/3$

Question 3

$(ax + p)(bx + q)$ with two of the three terms correct when expanded	**M1**
$(x - 2)(2x + 7)$	**A1**

Answer: $(x - 2)(2x + 7)$

Question 4

rearranges to $4x^2 + 3x - 7 = 0$	**M1**
factorises correctly	**M1**
one correct solution	**A1**
$x = -7/4$ or $x = 1$	**A1**

Answer: $x = -7/4$ or $x = 1$

Question 5

factorises numerator: $(x - 2)(x + 2)$	**M1**
factorises denominator: $(x + 2)(x + 3)$	**M1**
cancels common factor $(x + 2)$, ft from their factorisations	**M1**
$(x - 2) / (x + 3)$ cao	**A1**

Answer: $(x - 2) / (x + 3)$

Question 6

takes out common factor of 3: $3(x^2 + 2x - 15)$	**M1**
identifies a pair of numbers with sum 2 and product -15 (5 and -3)	**M1**
$3(x + 5)(x - 3)$ cao, fully factorised	**A1**

Answer: $3(x + 5)(x - 3)$

Question 7

factorises using difference of two squares: $(x - y)(x + y) = 45$	**M1**
substitutes $x - y = 5$ to obtain $5(x + y) = 45$, so $x + y = 9$	**M1**
solves the pair of linear equations $x - y = 5$ and $x + y = 9$ simultaneously	**M1**
$x = 7$ and $y = 2$, both values required	**A1**

Answer: $x = 7, y = 2$

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