Non-Calculator

Q1.

Circle the expression that is equivalent to $\frac{2x^2+1}{x}$ where x is not equal to 0

$2x + 1$ $2x^2 + \frac{1}{2}$ $2x + \frac{1}{x}$ $4x + \frac{1}{x}$

(Total 1 mark)

Q2.

(a) Show clearly that $(x + 5)(x - 5) \equiv x2 - 25$

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_____

(1)

(b) Simplify $\frac{3x^2-19x+20}{x^2-25}$

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Answer _____

(3)

(Total 4 marks)

Q3.

n is an integer.

Show that $\frac{n(n-1)}{2} + \frac{n(n+1)}{2}$ is a square number.

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(Total 3 marks)

Q4.

Simplify $\frac{5x^2 + 11x - 12}{x^2 + 3x}$

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Answer _____

(Total 3 marks)

Q5.

Solve $\frac{6}{x-2} - \frac{2}{x+3} = 1$

Answer _____

(Total 5 marks)

Q6.

(a) Factorise $2x2 - x - 3$

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_____

Answer _____

(2)

(b) Hence, simplify $\frac{2x^2 - x - 3}{4x^2 - 9}$

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Answer _____

(2)

(Total 4 marks)

Q7.

Show that $7 \div \frac{10}{x+2} = \frac{9}{x}$

simplifies to $7x2 + 15x - 18 = 0$

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(Total 3 marks)

Calculator

Q8.

Simplify $\frac{x^2+4x-12}{x^2-25} \div \frac{x+6}{x^2-5x}$

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Answer _____

(Total 5 marks)

Q9.

(a) Simplify fully $\frac{8c^7}{15d^6} \div \frac{6c^2}{5d^3}$

Answer _____

(3)

(b) Write as a single fraction $\frac{5}{m+1} + \frac{6}{m-4}$

Give your answer in its simplest form.

Answer _____

(4)

(Total 7 marks)

Q10.

(a) Show that $\frac{4}{x}+\frac{2}{x-1}$ simplifies to $\frac{6x-4}{x(x-1)}$

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(2)

(b) Hence, or otherwise, solve $\frac{4}{x}+\frac{2}{x-1}=3$

Give your solutions to 3 significant figures.

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Answer _____

(5)

(Total 7 marks)

Q11.

(a) Expand and simplify $(5x - 2y)(x + 2y)$

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Answer _____

(3)

(b) Solve $x\,2 - 2x - 2 = 0$

Give your answers to 1 decimal place.

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Answer _____

(3)

(c) Simplify $\frac{3x^2 - x - 10}{x^2 - 4}$

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Answer _____

(3)

(Total 9 marks)

Q12.

Prove $\frac{3n-1}{n} - \frac{3n+1}{n-2} \equiv \frac{2-8n}{n(n-2)}$ that

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(Total 4 marks)