Lesson 2

Additional Mathematics
A-Level Pure Mathematics : Year 1
Topics In Algebra

2.1 More Revision of GCSE Algebra (Homework)

Any solution based entirely on graphical
or numerical methods is not acceptable
Marks Available : 60

Question 1
IGCSE Examination Question from November 2007, Paper 4H, Q2 (Edexcel)

(a) Factorise $5x - 20$

[1 mark]

(b) Factorise $y^2 + 6y$

[2 marks]

Question 2
IGCSE Examination Question from May 2007, Paper 3H, Q9 (Edexcel)

(a) Solve $5x - 4 = 2x + 7$

[2 marks]

(b) Solve $\frac{7 - 2y}{4} = 2y + 3$

[4 marks]

Question 3

IGCSE Examination Question from January 2013, Paper 4H, Q8 (Edexcel)

(a) Factorise $n^2 + 8n$

[2 marks]

(b) Expand and simplify

$$3(2x - 5) - 4(x + 3)$$

[2 marks]

(c) Expand and simplify

$$(y + 7)(y + 2)$$

[2 marks]

Question 4

IGCSE Examination Question from May 2008, Paper 4H, Q6 (Edexcel)

Show that $\frac{2}{3} + \frac{1}{4} = \frac{11}{12}$

[2 marks]

Question 5

IGCSE Examination Question from May 2007, Paper 3H, Q5 (Edexcel)

(a) Simplify, leaving your answers in index form

(i) $7^5 \times 7^3$ **(ii)** $5^9 \div 5^3$

[2 marks]

(b) Solve $\dfrac{2^9 \times 2^4}{2^n} = 2^8$

[2 marks]

Question 6

IGCSE Examination Question from May 2008, Paper 3H, Q14 (Edexcel)

(a) Factorise $10y - 15$

[1 mark]

(b) Factorise $9p^2q + 12pq^2$

[2 marks]

(c) **(i)** Factorise $x^2 + 6x - 16$

(ii) Solve $x^2 + 6x - 16 = 0$

[3 marks]

Question 7

IGCSE Examination Question from January 2013, Paper 4H, Q15 (Edexcel)

(a) Simplify $\dfrac{5x^5y^6}{x^2y^4}$

[2 marks]

(b) Simplify $(2n^4)^3$

[2 marks]

Question 8

IGCSE Examination Question from May 2006, Paper 3H, Q13 (a) (c) (Edexcel)

(a) Expand and simplify $(3x - 5)(4x + 7)$

[2 marks]

(b) Simplify $(64y^6)^{\frac{2}{3}}$

[2 marks]

Question 9

Simplify the following algebraic expressions by first factorising the quadratics:

$$\frac{x^2 + 2x - 24}{x^2 - 3x - 54}$$

[2 marks]

Question 10

IGCSE Examination Question from May 2004, Paper 3H, Q16 (Edexcel)

Express this algebraic fraction as simply as possible

$$\frac{2x^2 - 3x - 20}{x^2 - 16}$$

[3 marks]

Question 11

Express as a single fraction

(i)

$$\frac{(3x + 7)}{5} + \frac{(7x - 4)}{3}$$

[3 marks]

(ii)

$$\frac{5(4x + 1)}{2} - \frac{3(7x - 2)}{5}$$

[3 marks]

Question 12

Simplify the following expression;

$$\frac{1}{(x+4)} + \frac{4}{(x+5)}$$

[3 marks]

Question 13

Beginning "LHS = " show that;

$$\frac{8}{(x-4)} + \frac{2}{(x+6)} = \frac{10(x+4)}{(x-4)(x+6)}$$

[3 marks]

Question 14

IGCSE Examination Question from May 2006, Paper 4H, Q4 (Edexcel)

Arul had x sweets.

Nikos had four times as many sweets as Arul.

(a) Write down an expression, in terms of x, for the number of sweets Nikos had.

[1 mark]

Nikos gave 6 of his sweets to Arul.

Now they both have the same number of sweets.

(b) Use this information to form an equation in x.

[2 marks]

(c) Solve your equation to find the number of sweets that Arul had at the start.

[2 marks]

Question 15

(a) Simplify

$$\frac{x^2 - 7x}{x^2}$$

[2 marks]

(b) Simplify

$$\frac{2}{x + 1} - \frac{4}{2x + 3}$$

[4 marks]

Question 16

Solve

$$\frac{x-3}{2}+\frac{x-2}{5}=10$$

[4 marks]

Question 17

IGCSE Examination Question from January 2013, 4H, Q15

Solve

$$\frac{2}{5x-2}=\frac{3}{6x+1}$$

[4 marks]

Question 18

Find the two solutions to the equation;

$$\frac{x}{x+5} = \frac{2}{x-7}$$

[4 marks]