

Let a
be for
algebra

TOPICS in ALGEBRA

Quadratic Equations & Inequalities

Lesson 1

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

1.1 Revision of GCSE Algebra

*Any solution based entirely on graphical
or numerical methods is not acceptable*

Marks Available : 60

Question 1

IGCSE Examination Question from November 2008, Paper 3H, Q2 (Edexcel)

(a) Factorise $7p - 21$

[1 mark]

(b) Solve $4(x + 5) = 12$

You must show sufficient working

[2 marks]

Question 2

IGCSE Examination Question from June 2011, Paper 3H, Q5 (Edexcel)

Show that $\frac{5}{6} - \frac{3}{4} = \frac{1}{12}$

[2 marks]

Question 3

IGCSE Examination Question from November 2008, Paper 3H, Q8 (Edexcel)

(a) Simplify

(i) $p^5 \times p$

(ii) $\frac{q^5}{q^3}$

[2 marks]

(b) Expand and simplify

$$3(4x - 1) - 4(2x - 3)$$

[2 marks]

(c) Expand and simplify

$$(y + 3)(y + 5)$$

[2 marks]

Question 4

IGCSE Examination Question from May 2012, Paper 3H, Q3 (Edexcel)

- (a) Write as a single power of 2,

$$2^3 \times 2^6$$

[1 mark]

- (b) Write as a single power of 3,

$$\frac{3^9}{3^4}$$

[1 mark]

- (c)

$$\frac{5^n}{5^4 \times 5^6} = 5^3$$

Find the value of n .

[2 marks]

Question 5

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

- (a) Factorise completely

$$9ab - 12b^2$$

[2 marks]

- (b) Simplify

$$(2ab^2)^3$$

[2 marks]

Question 6

IGCSE Examination Question from May 2012, Paper 3H, Q17 (Edexcel)

(a) Simplify

$$(3a^2b)^4$$

[2 marks]

(b) Simplify

$$(9c^8)^{\frac{1}{2}}$$

[2 marks]

Question 7

(a) Factorise $x^2 - 8x + 12$

[2 marks]

(b) Factorise $x^2 - 81$

[1 mark]

Question 8

Simplify the following algebraic expressions by first factorising the quadratics:

$$\frac{x^2 + 3x - 88}{x^2 - 2x - 48}$$

[2 marks]

Question 9

Simplify fully

$$\frac{x^2 + 5x}{x^2 - 25}$$

[3 marks]

Question 10

Express as a single fraction

(i)

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

[3 marks]

(ii)

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

[3 marks]

Question 11

Simplify the following expression;

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

[3 marks]

Question 12

Beginning "LHS = " show that;

$$\frac{3}{(x + 6)} + \frac{5}{(x - 10)} = \frac{8x}{(x + 6)(x - 10)}$$

[3 marks]

Question 13

(a) Simplify

$$\frac{x^2}{x^2 - 5x}$$

[2 marks]

(b) Simplify

$$\frac{6}{2x - 9} - \frac{2}{2x + 3}$$

[4 marks]

Question 14

Solve

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

[4 marks]

Question 15

Solve the equation;

$$\frac{x}{2} = \frac{2(x - 2)}{7}$$

[3 marks]

Question 16

Find the two solutions to the equation;

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

[4 marks]

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Teachers may obtain detailed worked solutions to the exercises by email from MHHShrewsbury@Gmail.com