Algebra

GCSE Maths · Practice Questions

20 questions · 62 marks total

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Section A · Foundation

Questions 1–3 are the most straightforward; they get harder as you go on. Question 10 is the most challenging.

1 **[1 mark]**

Simplify $5a + 3a - 2a$

2 **[2 marks]**

Work out the value of

(a) $3x + 4$ when $x = 5$

(b) $2x^2$ when $x = 3$

3 **[2 marks]**

Expand

(a) $4(x + 3)$

(b) $3(2y - 5)$

4 **[2 marks]**

Solve $5x - 7 = 23$

5 **[3 marks]**

Factorise fully

(a) $6x + 15$

(b) $x^2 + 7x$

(c) $8ab - 12a$

6 [3 marks]

Here are the first four terms of a sequence.

5 9 13 17

(a) Write down the next two terms.

(b) Find an expression for the nth term.

(c) Is 100 a term of this sequence? You must give a reason.

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7 [3 marks]

Solve $4(x - 2) = 2x + 10$

.....

8 [3 marks]

(a) Solve the inequality $5x - 3 \leq 17$

(b) Write down the largest integer that satisfies your inequality.

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9 [4 marks]

Solve the simultaneous equations

$3x + y = 14$

$x + y = 6$

.....

10 [5 marks]

A rectangle has length $(2x + 3)$ cm and width $(x - 1)$ cm.

The perimeter of the rectangle is 34 cm.

(a) Show that $6x + 4 = 34$

(b) Solve your equation to find x.

(c) Work out the area of the rectangle.

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Section B · Higher

Higher-tier style. Again, questions 1–3 are the gentlest and question 10 is the hardest.

1 **[2 marks]**

Expand and simplify $(x + 5)(x - 3)$

2 **[2 marks]**

Simplify

(a) $x^5 \times x^3$

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

3 **[3 marks]**

Factorise

(a) $x^2 - 49$

(b) $2x^2 + 7x + 3$

4 **[3 marks]**

Solve the simultaneous equations

$3x + 2y = 19$

$5x - 2y = 5$

5 **[3 marks]**

Make x the subject of the formula

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

6 **[4 marks]**

Simplify fully

$$\frac{x^2 - 9}{x^2 + x - 12}$$

7 **[4 marks]**

$f(x) = 3x - 1$ and $g(x) = x^2 + 2$

(a) Work out fg(2)

(b) Find gf(x), giving your answer in the form $ax^2 + bx + c$

(c) Find $f^{-1}(x)$

8 **[4 marks]**

Here are the first five terms of a quadratic sequence.

3 8 15 24 35

Find an expression for the nth term.

9 **[4 marks]**

Solve the inequality

$x^2 - 5x - 14 > 0$

10 **[5 marks]**

Prove that the sum of the squares of any two consecutive odd numbers is always 2 more than a multiple of 8.