

Algebra Focus

Mixed practice paper · Calculator allowed

Name: _____

Date: _____

Total: **40 marks**

Instructions

- Answer all questions in the spaces provided.
- Show all working. Marks may be awarded for method.
- Diagrams are not drawn to scale.
- Calculators may be used unless a question says otherwise.

1 Quadratic formula

3 marks

Solve $x^2 - 5x - 3 = 0$. Give your answers to 3 significant figures.

2 Rearranging formulae

3 marks

Make x the subject of $y = (3x - 3)/5$.

3 Expanding brackets

2 marks

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

4 Direct & inverse proportion

3 marks

y is directly proportional to x . When $x = 2$, $y = 6$. Work out y when $x = 4$.

5 Sequences (n th term)

2 marks

Here are the first five terms of a sequence:

7, 12, 17, 22, 27

(a) Find an expression for the n th term.

(b) Hence find the 50th term.

6 Completing the square

3 marks

Write $x^2 - 10x + 32$ in the form $(x + p)^2 + q$.

7 Factorising quadratics

2 marks

Factorise $x^2 + 3x + 2$.

8 Surds

2 marks

Rationalise the denominator of $28/\sqrt{7}$. Give your answer in its simplest form.

9 Functions

4 marks

$f(x) = 5x + 4$ and $g(x) = x^2 - 9$.

(a) Work out $fg(2)$.

(b) Find $f^{-1}(x)$.

10 Solving linear equations

3 marks

Solve the equation $(3x - 1)/2 = (x - 17)/4$.

11 Simultaneous equations

4 marks

Solve the simultaneous equations

$$4x + 5y = 24$$

$$x + 3y = 13$$

12 Inequalities

3 marks

Find the integer values of x that satisfy $-1 < 2x + 1 \leq 11$.

13 Algebraic fractions

2 marks

Simplify $\frac{x^2 - 49}{x - 7}$.

14 Compound measures

2 marks

A metal block has a density of 7.5 g/cm^3 and a volume of 30 cm^3 . Work out its mass.

Work out $(5.9 \times 10^{-3}) \times (8.3 \times 10^0)$. Give your answer in standard form.
