

# First Year Maths and Further Maths combined Test B3

## Surds and straight lines

24 minutes

Throughout the entire test **all working must be shown** and solutions based entirely on graphical or numerical methods may not be acceptable (**this means you can't just stick it in your calculator**).

1.

(a) Simplify  $(3\sqrt{5})^2$ .

[1 mark]

**(b)** Express  $\frac{(3\sqrt{5})^2 + \sqrt{5}}{7 + 3\sqrt{5}}$  in the form  $m + n\sqrt{5}$ , where  $m$  and  $n$  are integers.

**[4 marks]**

[illegible]

[illegible]

2.

(a) Simplify

$$\sqrt{50} - \sqrt{18}$$

giving your answer in the form  $a\sqrt{2}$ , where  $a$  is an integer.

(2)

(b) Hence, or otherwise, simplify

$$\frac{12\sqrt{3}}{\sqrt{50} - \sqrt{18}}$$

giving your answer in the form  $b\sqrt{c}$ , where  $b$  and  $c$  are integers and  $b \neq 1$

(3)

[illegible]

[illegible]

3.

A line  $L$  is parallel to  $y = 4x + 5$  and passes through the point  $(-1, 6)$ . Find the equation of the line  $L$  in the form  $y = ax + b$ . Find also the coordinates of its intersections with the axes. [5]

[illegible]

[illegible]

4.

The point  $P$  has coordinates  $(\sqrt{3}, 2\sqrt{3})$  and the point  $Q$  has coordinates  $(\sqrt{5}, 4\sqrt{5})$ . Show that the gradient of  $PQ$  can be expressed as  $n + \sqrt{15}$ , stating the value of the integer  $n$ .

**[5 marks]**

[illegible]



[illegible]