

**[4 marks]**

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slight shadow on the right side, suggesting it's resting on a surface.

2

Prove that  $35 + (3x + 1)^2 - 2x(4x - 3)$  is a square number.

**[4 marks]**

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

**3**

	Distance (km)	Average speed (km/h)	Time (h)
<b>Stage 1</b>	30	$a$	$\frac{30}{a}$
<b>Stage 2</b>	30	$b$	$\frac{30}{b}$

Show that the average speed for the **whole** journey, in km/h, is  $\frac{2ab}{a+b}$

**[3 marks]**

- 4** A factory packs  $x$  boxes of teabags per hour.  
Each box contains 80 teabags.

Show that the factory packs  $\frac{4x}{3}$  teabags per minute.

**[2 marks]**

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5

Two integers have a difference of 6

The integers are multiplied together.

9 is then added.

Prove algebraically that the result is always a square number.

[3 marks]

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