

Question 1. (AQA June 2004 Intermediate Paper 2 Calculator OK)

|   |  |
|---|--|
| <p>(a) <math>k</math> is an even number.<br/>Jo says that <math>\frac{1}{2}k + 1</math> is always even.<br/>Give an example to show that Jo is wrong.</p> | <p>(b) The letters <math>a</math> and <math>b</math> represent prime numbers.<br/>Give an example to show that <math>a + b</math> is <b>not</b> always an even number.</p> |
| [1 mark]  | [1 mark]   |

Question 2. (AQA June 2006 Intermediate Paper 2 Calculator OK)

Hassan says



When you square a positive number the answer is always bigger than the original number.

For example  $2.5^2 = 6.25$  and  $6.25$  is bigger than  $2.5$

Find an example to show that Hassan is wrong.  
You **must** show your working.

[2 marks]

Question 3. (AQA June 2003 Intermediate Paper 1 NO Calculator)

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| <p><math>p</math> is an odd number.<br/>Explain why <math>p^2 + 1</math> is always an even number.</p> |
| [2 marks]  |

Question 4. (AQA June 2004 Intermediate Paper 1 NO Calculator)

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|---|---|
| <p>Tom, Sam and Matt are counting drum beat.<br/>Tom hits a snare drum every 2 beats.<br/>Sam hits a kettle drum every 5 beats.<br/>Matt hits a bass drum every 8 beats.</p> <p>They start by hitting their drums at the same time.</p> | <p>How many beats is it before Tom, Sam and Matt <b>next</b> hit their drums at the <b>same</b> time?</p> |
|   | [2 marks]   |

Question 5. (AQA November 2004 Intermediate Paper 2 Calculator OK)

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| <p><math>P</math> is a prime number.<br/><math>Q</math> is an odd number.<br/>State whether each of the following is always odd or always even or could be either odd or even.<br/>Tick the appropriate box.</p>   |  |  |
| <p>(a) <math>P(Q + 1)</math></p> <p style="text-align: center;"> <input type="checkbox"/> Always odd                      <input type="checkbox"/> Always even                      <input type="checkbox"/> Could be either odd or even             </p> <p style="text-align: right;">(1 mark)</p> |  |  |
| <p>(b) <math>Q - P</math></p> <p style="text-align: center;"> <input type="checkbox"/> Always odd                      <input type="checkbox"/> Always even                      <input type="checkbox"/> Could be either odd or even             </p> <p style="text-align: right;">(1 mark)</p>    |  |  |

Question 6. (AQA June 2003 Intermediate Paper 1 NO Calculator)

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|--|--|
| <p>(a) Work out the value of <math>5^7 \div 5^4</math></p>   | <p>(b) <math>a</math> and <math>b</math> are prime numbers.<br/><math>ab^3 = 54</math><br/>Find the values of <math>a</math> and <math>b</math>.</p> |
| [2 marks]  | [2 marks]  |
| <p>(c) Find the Highest Common Factor (HCF) of 54 and 135.</p> <p style="text-align: right;">[2 marks]</p> |  |

Question 7. (AQA June 2005 Intermediate Paper 1 NO Calculator)

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|--|--|
| <p>(a) Write 18 as the product of its prime factors.</p> | <p>(b) What is the least common multiple (LCM) of 12 and 18?</p> |
| [2 marks]  | [1 mark]   |