

# Structuring a Proof

Cut out along the dotted lines. When rearranged correctly a message should appear.

<p>If I have three consecutive numbers, one of them must be a multiple of 3.</p>	<p><b>A</b></p>	<p><math>(p - 1)(p + 1)</math> is a multiple of both 3 and 8, so <math>(p - 1)(p + 1)</math> is a multiple of 24.</p>	<p><b>G</b></p>
<p>QED</p>	<p><b>!</b></p>	<p><math>p</math> is an odd number, so <math>(p - 1)</math> and <math>(p + 1)</math> must both be multiples of 2.</p>	<p><b>I</b></p>
<p><math>(p - 1)(p + 1)</math> is the product of a multiple of 2 and a multiple of 4, so must be a multiple of 8.</p>	<p><b>I</b></p>	<p><math>(p - 1)</math> and <math>(p + 1)</math> are consecutive even numbers, so either <math>(p - 1)</math> or <math>(p + 1)</math> must be a multiple of 4.</p>	<p><b>R</b></p>
<p><math>(p - 1)</math>, <math>p</math>, and <math>(p + 1)</math> are consecutive numbers.</p>	<p><b>T</b></p>	<p>Let <math>p</math> be a prime number greater than 3.</p>	<p><b>T</b></p>
<p><math>p</math> is prime and greater than 3, so <math>p</math> cannot be a multiple of 3.</p>	<p><b>H</b></p>	<p>Either <math>(p - 1)</math> or <math>(p + 1)</math> must be a multiple of 3, so the product <math>(p - 1)(p + 1)</math> must also be a multiple of 3.</p>	<p><b>S</b></p>
<p>The expression <math>p^2 - 1</math> can be factorised as <math>(p - 1)(p + 1)</math>.</p>	<p><b>H</b></p>	<p>Therefore, for any prime number <math>p</math> greater than 3, <math>p^2 - 1</math> is a multiple of 24.</p>	<p><b>T</b></p>