**Algebraic Proofs - GREEN**

1. Prove that the sum of any odd number and any even number is odd.
2. Prove that half the sum of four consecutive numbers is odd.
3. Prove that the sum of any three consecutive numbers is a multiple of 3.
4. Prove that the product of any odd number and any even number is even.
5. Prove that the product of any two odd numbers is odd.
6. Prove that the product of any two even numbers is even.
7. Prove that for any two numbers, the product of their difference and their sum is equal to the difference of their squares.
8. Prove that, if the difference of two numbers is 4, then the difference of their squares is a multiple of 8.
9. Prove that the sum of any 3 consecutive even numbers is a multiple of 6.
10. Prove that the sum of two consecutive odd numbers is a multiple of 4.

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**Algebraic Proofs - AMBER**

1. Prove that the sum of any odd number and any even number is odd.

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|  | Prove that the sum of any odd number and any even number is odd. |
| 1. | Write down an odd number using algebra. |
| 2. | Write down an even number using algebra. |
| 3.  | Add them together and simplify. |
| 4. | Is this odd? (ie. One more than an even number) |

1. Prove that half the sum of four consecutive numbers is odd.

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|  | Prove that half the sum of four consecutive numbers is odd. |
| 1. | Write down a number using algebra. |
| 2. | Add one to it to give your next number and do this two more times. |
| 3.  | Add these together and half it. |
| 4. | Is this odd? |

1. Prove that the sum of any three consecutive numbers is a multiple of 3.
2. Prove that the product of any odd number and any even number is even.
3. Prove that the product of any two odd numbers is odd.
4. Prove that the product of any two even numbers is even.
5. Prove that for any two numbers, the product of their difference and their sum is equal to the difference of their squares.
6. Prove that, if the difference of two numbers is 4, then the difference of their squares is a multiple of 8.
7. Prove that the sum of any 3 consecutive even numbers is a multiple of 6.
8. Prove that the sum of two consecutive odd numbers is a multiple of 4.

**Algebraic Proofs - RED**

1. Prove that the sum of any odd number and any even number is odd.

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|  | Prove that the sum of any odd number and any even number is odd. |
| 1. | Write down an odd number using algebra. |
| 2. | Write down an even number using algebra. |
| 3.  | Add them together and simplify. |
| 4. | Is this odd? (ie. One more than an even number) |

1. Prove that half the sum of four consecutive numbers is odd.

|  |  |
| --- | --- |
|  | Prove that half the sum of four consecutive numbers is odd. |
| 1. | Write down a number using algebra. |
| 2. | Add one to it to give your next number and do this two more times. |
| 3.  | Add these together and half it. |
| 4. | Is this odd? |

1. Prove that the sum of any three consecutive numbers is a multiple of 3.

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| --- | --- |
|  | Prove that the sum of any three consecutive numbers is a multiple of 3 |
| 1. | Write down a number using algebra. |
| 2. | Add one to it to give your next number and do this once more. |
| 3.  | Add these together and factorise. |
| 4. | Is there a factor of 3? |

1. Prove that the product of any odd number and any even number is even.

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|  | Prove that the product of any odd number and any even number is even. |
| 1. | Write down an even number using algebra. |
| 2. | Write down an odd number using algebra. (Hint: use a different letter!) |
| 3.  | Multiply these together. |
| 4. | Is this even? |

1. Prove that the product of any two odd numbers is odd.

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|  | Prove that the product of any two odd numbers is odd. |
| 1. | Write down an odd number using algebra. |
| 2. | Write down another odd number using algebra. (Hint: use a different letter!) |
| 3.  | Multiply these together. |
| 4. | Is this odd? |

1. Prove that the product of any two even numbers is even.
2. Prove that for any two numbers, the product of their difference and their sum is equal to the difference of their squares.
3. Prove that, if the difference of two numbers is 4, then the difference of their squares is a multiple of 8.
4. Prove that the sum of any 3 consecutive even numbers is a multiple of 6.
5. Prove that the sum of two consecutive odd numbers is a multiple of 4.