

## ALGEBRA - PROOF

Page	Description
1	Prove or disprove a statement by considering several examples
2	Construct a proof using algebra

# Algebraic Proof - Two types of questions

Type 1 - Come to a conclusion by considering several examples

1) The number  $a$  is prime and  $b$  is even.

Is  $a + b$  even, odd or either

Is  $a \times b$  even, odd or either

You must write down several examples to cover all the possibilities.  
Remember for prime numbers to consider 2 the only even prime.  
Remember to answer the question.

2) ' $q$ ' is an odd whole number and ' $p$ ' is an even whole number. Answer the following questions.

a) Is  $pq$  odd even could be either

b) Is  $3(p + q)$  odd even could be either

c) Is  $p \div q$  an integer not an integer could be either

## Type 2 - Using algebra construct a proof

Helpful results - if  $n$  is an integer

$2n$  is always even

Consecutive even numbers are  $2n$  and  $2n + 2$

$2n + 1$  is always odd

Consecutive odd numbers are  $2n + 1$  and  $2n + 3$

$4n$  is a multiple of 4

$3(n + 2)$  is a multiple of 3 etc..

1)  $n$  is an integer (whole number)

Is  $(n + 1)^2 - (n - 1)^2$  even or odd?

2) Prove that the difference between the squares of two consecutive odd numbers is always a multiple of 8.

3) Prove that angle  $X$  is equal to  $a + b$

