

Task 1 – State whether each of the following are always, sometimes or never true.

- 1) A multiple of 10 is even.
- 2) The sum of two odd numbers is odd.
- 3) The product of three even numbers is even.
- 4) The factors of a prime number are all prime.
- 5) The product of two odd numbers is odd.
- 6) A square number is also a cube number.
- 7) The difference between two square numbers is even.
- 8) The sum of three consecutive numbers is a multiple of 3.
- 9) The quotient of two different even numbers is even.
- 10) The product of an even number and an odd number is odd.

Task 2

- 11) A is an even number and B is an odd number.
Explain why $3(A + B)$ is always odd.
- 12) A is an odd number. Give three examples to support, A^2 is always odd.

13) N is a multiple of 6. Explain why N must also be a multiple of 2 and 3.

14) P is a square number and Q is a cube number. Maya says that $P + Q$ is always odd. Give a counterexample example to prove her wrong.

Task 3

- 15) A rectangle has integer side lengths. Its area is odd. What can you say about its side lengths?
- 16) The sum of two prime numbers is always even. True or false? Give three examples.
- 17) The product of two consecutive even numbers is divisible by 8. Always, sometimes, or never true? Explain.
- 18) The difference between two consecutive integers is always, sometimes or never odd?
- 19) A fraction in the form $\frac{\text{odd}}{\text{even}}$ can be simplified to an integer. Always, sometimes, or never?
- 20) A sequence is formed by multiplying the prior term by 2. If the first term is odd, explain why every term after will be even.