

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.