**Algebraic Proof with Multiples**

(a) Show that is a multiple of for all integer values of

(b) Show that is a multiple of for all integer values of

(c) Show that is a multiple of for all integer values of

(d) Show that

is a multiple of for all integer values of

(a) Show that the sum of three consecutive integers is always a multiple of

(b) Show that the sum of three consecutive even numbers is always a multiple of

(c) Show that the product of two consecutive even numbers is always a multiple of

(a) Prove algebraically that the sum of three consecutive square numbers is never a multiple of

(b) Prove algebraically that the sum of the squares of any two odd numbers is never a multiple of

(c) Prove algebraically that the product of two consecutive odd numbers is never a multiple of

(a) Prove algebraically that the product of three consecutive even numbers is always a multiple of

(b) Prove algebraically that the sum of the cubes of two consecutive even numbers is always a multiple of

(c) Prove algebraically that the product of the squares of two odd numbers is always one more than a multiple of

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