Practice Questions 2

February 5, 2020

1) Show that if $a$ and $b$ are integers with $(a, b) = 1$, then $(a + b, a - b) = 1$ or 2.

2) What is $(a^2 + b^2, a + b)$ where $a$ and $b$ are relatively prime integers that are not both 0?

3) Show that if $a$, $b$ and $c$ are integers with $(a, b) = (a, c) = 1$, then $(a, bc) = 1$.

4) Show that if $n$ is a positive integer, then $(2n^2 + 6n - 4, 2n^2 + 4n - 3) = 1$.

5) Show that if $k$ is an integer, then the integers $6k - 1$, $6k + 1$, $6k + 2$, $6k + 3$ and $6k + 5$ are pairwise relatively prime. Use this to show that every positive integer greater than 6 is the sum of two relatively prime integers.