

Name: _____ Score (Out of 9 points):

A non-programmable, non-scientific calculator may be used.

1. (a) [2 points] Use the Euclidean algorithm to compute the greatest common divisor of 170 and 245.

(b) [2 points] Find integers u and v such that $245u + 170v = \gcd(245, 170)$.

2. Suppose that $a, b \in \mathbb{Z}$ and that $\gcd(a, b) = d$. Let $c > 0$ be a common divisor of a and b . Recall that we proved that $\frac{d}{c}$ is an integer.

(a) [4 points] Using the definitions of divisibility and gcd, prove that $\gcd\left(\frac{a}{c}, \frac{b}{c}\right) = \frac{d}{c}$.

(b) [1 point] Conclude as a special case that $\gcd\left(\frac{a}{d}, \frac{b}{d}\right) = 1$.