

**QUIZ #4 – MATH 2200
SPRING 2018**

MARCH 9TH, 2018

1. Suppose that $n \mid m$ where $n, m \in \mathbb{Z}_{>0}$. Suppose also that $a \equiv b \pmod{m}$. Prove that
- $$a \equiv b \pmod{n}.$$

(10 points)

Solution: Since $a \equiv_m b$, we know $m \mid (a - b)$. Since $n \mid m$, we conclude that $n \mid (a - b)$. Thus by definition $a \equiv_n b$.

2. Use the Euclidean Algorithm to find $\gcd(1001, 1331)$. Write out all your steps logically and carefully. (10 points)

Solution: We first write

$$1331 = 1001 \cdot 1 + 330$$

and so we must compute $\gcd(1001, 330)$. Next we write

$$1001 = 330 \cdot 3 + 11$$

and so we must compute $\gcd(330, 11)$. But 11 is a factor of 330 so that the gcd is 11. In conclusion

$$\gcd(1001, 1331) = \gcd(1001, 330) = \gcd(330, 11) = 11.$$