Mathematics 216
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Homework 22
Due March 23, 2012

1. Define a relation on $\mathbf{Z}$ by setting $a \sim b$ if $ab > 0$. Is this an equivalence relation? If so, how many unequal equivalence classes are there?

2. Now define a relation on $\mathbf{Z}$ by setting $a \sim b$ if $ab \geq 0$. Is this an equivalence relation? If so, how many unequal equivalence classes are there?

3. Use the Chinese Remainder Theorem to find the smallest positive integer n so that

$$n \equiv 23 \pmod{34}$$
$$n \equiv 11 \pmod{23}$$
$$n \equiv 14 \pmod{19}$$