

Assignment #6 due Friday 10/20 by 5pm

Exam 2 will cover chapters 4 and 5.

Scheduled for Monday 10/31.

For assignment #6 problem 2

You may use the fact that

- odd + odd = even
- odd + even = odd
- even + even = even.

Proposition If $a, b \in \mathbb{Z}$, then

$a+b$ is even if and only if a and b have the same parity.

proof

Assume $a, b \in \mathbb{Z}$.

(\leftarrow) Assume a and b have the same parity.

That is, either $a=2k$ and $b=2l$ for some $k, l \in \mathbb{Z}$

OR

$a=2k+1$ and $b=2l+1$ for some $k, l \in \mathbb{Z}$.

In the former case $a+b=2k+2l=2(k+l)$ which is even.

In the latter case $a+b = 2k+1+2l+1 = 2(k+l+1)$ which is even.

(\rightarrow) Assume a and b do not have the same parity.

Therefore, without a loss of generality,

$$a = 2k \text{ and } b = 2l+1 \text{ for some } k, l \in \mathbb{Z}.$$

So now $a+b = 2k+2l+1 = 2(k+l)+1$ which is not even. ▣