Mathematics 174

Quiz # 6 Name: Key

You must show your work to get full credit.

1. Show that the if m and n then $mn+3$ is even.

If m and n are even, then for some integers k, l

$m = 2k+1$

$\cancel{n} = 2l+1$

Then $mn+3 = (2k+1)(2l+1)+3$

$= 4kl + 2k + 2l + 1 + 3$

$= 4kl + 2k + 2l + 4$

$= 2(2kl + k + l + 2)$

$= 2(\text{integer})$

Thus $mn+3$ is even

2. Show that if $n \geq 4$ that $n^2 - 4$ is never prime.

$n^2 - 4 = (n-2)(n+2)$ and $n-2 \geq 2$ (as $n \geq 4$)

$n+2 \geq 6$ (as $n \geq 4$)

Thus n^2-4 factors and whence is not prime.