

Mathematics 300

Quiz 18

Name: \_\_\_\_\_

*You must show your work to get full credit.*

1. Show that for all integers  $n$  that  $n^3 - n^2$  is even.

**2.** Define for any real number  $x$  define:

$$\operatorname{sgn}(x) = \begin{cases} 1, & x > 0; \\ 0, & x = 0; \\ -1, & x < 0. \end{cases}$$

Show for  $x \neq 0$  that  $\frac{x}{|x|} = \operatorname{sgn}(x)$ .