Part I (due Friday, September 11 at the beginning of class)

Consider this definition:

Definition 1. *An integer n is* separable *if there is some $k \in \mathbb{Z}$ such that $(n-2k)(k-2n) = 0$.*

In light of this definition, answer these questions:

1. Create some examples of separable integers. Make sure you show each of your examples is separable.
2. We can compute $\left(9 - 2\left(\frac{9}{2}\right)\right)\left(\frac{9}{2} - 2(9)\right) = 0$. What does this tell us (if anything) about whether 9 is separable?

Part II: Exercises (for presenting Friday, September 11)

1. Prove/disprove each statement (if true, prove; if false, give an explained counterexample and then try to fix the statement as strongly as possible and prove the fixed version):
   (a) Every integer is separable.
   (b) If x, y, z are integers such that $x + z$ is odd and $y + z$ is odd, then $x + y$ is odd.
   (c) If n is an integer, then $n^2 + 3n + 2$ is even.

Part III: Problems (due Friday, September 11, at the beginning of class)

1. Prove/disprove (if true, prove; if false, give an explained counterexample and then try to fix the statement as strongly as possible and prove the fixed version): if a, b, and c are integers, then $ab + ac$ is an even integer.

mini-Celebration of Learning Friday

- logical equivalence (truth tables)
- parity