Algebra 2: Homework 2

1. Which set of numbers is *not* closed with respect to the given operation?
   (1) integers with respect to multiplication
   (2) even integers with respect to addition
   (3) integers with respect to subtraction
   (4) odd integers with respect to addition

In 2 – 6, name the property of real numbers that is illustrated by the given equation.

2. $m + 2n = 2n + m$

3. $(r + s) + t = t + (r + s)$

4. $2(x + 2y) = 2x + 4y$

5. $\sqrt{z} \cdot \frac{1}{\sqrt{z}} = 1$

6. $\otimes + (\Delta + 0) = (\otimes + \Delta) + 0$

7. Which of the following sets of real numbers is closed under division?
   (1) {1} (3) {0}
   (2) {all positive integers} (4) $\{-1\}$

In 8 and 9, determine under which of the four basic arithmetic operations (addition, subtraction, multiplication, and division) each set is closed.

8. $\left\{1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \frac{1}{32}, \ldots\right\}$

9. {all positive multiples of 3}

10. State whether each number below is *rational* or *irrational*.

a. 0.877777...	*d*. $\frac{2}{7}$	*g*. $\sqrt{81\pi}$
b. $\frac{\pi}{2}$	*e*. $86.\overline{67}$	*h*. 3.14159
c. 5.9863	*f*. $\sqrt{81}$	*i*. 9.99999465872194...