

**Lesson #4 A: Understanding and Using the Properties of Real Numbers to Simplify Expressions  
(Reference: Lesson #12, #15 & #18 in book)****Problem**

1. For each of the following determine the properties of real numbers that are being used.

1.  $(4 + 5) \cdot (xy) = (xy) \cdot (4 + 5)$

2.  $\left(\frac{xy}{cd}\right) \cdot \left(\frac{cd}{xy}\right) = 1$

3.  $(-xyz + abc) + 123 = -xyz + (abc + 123)$

4.  $-3xz(-4cd - mn + 2) = 12cdxz + 3mnxz - 6xz$

5.  $(xy \cdot cd) + (mn) = (mn) + (xy \cdot cd)$

6. Simplify each of the following equations using the properties of real numbers.

6.  $6y(2z + 5x)$

7.  $5x(3y - 4) - 12xy + 16x$

8.  $3(3yz - 2xz + 4) - 4z(2y - 4x)$

9.  $2by(5ax - dz + 8) - 7abxy - 20by$

10.  $2[4a(5b + 3c + 4) - 8a + 4 - 12ab]$