

Lesson #1 A: Understanding and Using the Properties of Real Numbers to Simplify Expressions
(Reference: Lesson #1 & #2 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 and the concept of collecting like terms.

6. $6(2z + 5x) - 15z - 18x + 6$

7. $3k^2 + kx^4 - 2k^2 + 2kx^4 + 4k^2$

8. $2x^2y^3 + xy - 8y^3x^2 - 5yx$

9. $-3xyz^3 + 6xy^2 + 5y^2z^2 - 4xy^2 + 7xyz^3 - 2yz$

10. $8ab^3 - 7ac + 9a^2bc^3 - 6ab^3 - 3a^2bc^3 + 7ac$

11. $5x(3y - 4) - 12xy + 16x$

12. $3(3yz - 2xz + 4) - 4z(2y - 4x)$

13. $2by(5ax - dz + 8) - 7abxy - 20by$

14. $2[4a(5b + 3c + 4) - 8a + 4 - 12ab]$