Properties of Operations

1. **Commutative Property** (+ and x) "Travel - Switch order"

   $5 + 3 = 3 + 5$ $b + 9 = 9 + b$ $7 x 4 = 4 x 7$ $-3 x 2 = 2 x -3$

2. **Associative Property** (+ and x) "Grouping changes"

   $(2 + 4) + 9 = 2 + (4 + 9)$ $(3 x 5) x 4 = 3 x (5 x 4)$

3. **Distributive Property** "Everyone in the group gets some"
   "Break it out of jail"

   $4(3p + 5) = 4x3p + 4x5$ or $12p + 20$ $5(12 - 3) = 60 - 15$

4. **Identity Property** "It is what it is. That is its DNA."

   Anything + 0 = itself $5 + 0 = 5$ $m + 0 = m$

   Anything x 1 = itself $12 x 1 = 12$ $g x 1 = g$

5. **Zero Property** "Zero it out"

   Anything x 0 = 0 $9 x 0 = 0$ $d x 0 = 0$

6. **Inverse Property** "Cancel it out"

   Anything + its additive inverse (opposite) = 0 $8 + -8 = 0$

   Anything x its multiplicative inverse (reciprocal) = 1

   $\frac{3}{7}$ x $\frac{7}{3}$ = 1 $4\frac{1}{8}$ x $\frac{8}{33}$ = 1 4 x $\frac{1}{4}$ = 1

PROPERTIES presentation.ppt