

## Properties of Real Numbers

- **identity property of addition**\_Adding 0 to a number leaves it unchanged
- **identity property of multiplication**\_Multiplying a number by 1 leaves it unchanged
- **multiplication property of 0**\_Multiplying a number by 0 gives 0
- **additive Inverse & definition of opposites**\_Adding a number to its opposite gives 0
  - Every number has an opposite
  - **definition of subtraction**\_x-y is x plus the opposite of y
- **multiplicative inverse & definition of reciprocal**\_Multiplying a number by its reciprocal gives 1
  - Every number except 0 has a reciprocal
  - **definition of division**\_x/y is x times the reciprocal of y

### order properties

- **commutative property of addition**\_  $x + y = y + x$
- **commutative property of multiplication**\_  $xy = yx$

### regrouping properties

- **associative property of addition**  $(x + y) + z = x + (y + z)$
- **associative property of multiplication**  $(xy)z = x(yz)$

### **distributive property** $x(y + z) = xy + xz$

### properties of equality

- **reflexivity of equality**\_  $x = x$
- **symmetry of equality**\_if  $x = y$  then  $y = x$
- **transitivity of equality**\_if  $x = y$  and  $y = z$  then  $x = z$
- **addition property of equality**\_ if  $a = b$  the  $a + c = b + c$
- **multiplicative property of equality**\_ if  $a = b$  the  $a * c = b * c$