Example 1 **Find the value of each expression. Then name the sets of numbers to which each value belongs.**

a. $\sqrt{17}$

$\sqrt{17} = 4.1231056\ldots$ reals (R), irrationals (I)

b. $8 \div 4$

$8 \div 4 = 2$ reals (R), rationals (Q), integers (Z), whole numbers (W), natural numbers (N)

c. 0.25×0

$0.25 \times 0 = 0$ reals (R), rationals (Q), integers (Z), whole numbers (W)

d. $10 - 25$

$10 - 25 = -15$ reals (R), rationals (Q), integers (Z)

e. $6 \div 10$

$6 \div 10 = 0.6$ or $\frac{3}{5}$ reals (R), rationals (Q)

Operations with real numbers have several important properties. The chart below summarizes the properties of real numbers for addition and multiplication.

For any real numbers a, b, and c:		
	Addition	**Multiplication**
Commutative	$a + b = b + a$	$a \cdot b = b \cdot a$
Associative	$(a + b) + c = a + (b + c)$	$(a \cdot b) \cdot c = a \cdot (b \cdot c)$
Identity	$a + 0 = a = 0 + a$	$a \cdot 1 = a = 1 \cdot a$
Inverse	$a + (-a) = 0 = (-a) + a$	If $a \neq 0$, then $a \cdot \frac{1}{a} = 1 = \frac{1}{a} \cdot a$.
Distributive	$a(b + c) = ab + ac$ and $(b + c)a = ba + ca$	

$-a$ is read "the opposite of a".

Example 2 **Name the property illustrated by each equation.**

a. $(3 + 4a)2 = 2(3 + 4a)$

commutative property of multiplication

The commutative property says that the order in which you multiply does not change the product.

b. $62 + (38 + 75) = (62 + 38) + 75$

associative property of addition

The associative property says that the way you group three numbers when adding does not change their sum.