

1. Name the property that has been used in each example.

- (a)  $(6 + 3) + 5 \cdot 4 = (3 + 6) + 5 \cdot 4$
- (b)  $(6 + 3) + 5 \cdot 4 = 6 + (3 + 5 \cdot 4)$
- (c)  $(6 + 3) + 5 \cdot 4 = (6 + 3) + 4 \cdot 5$
- (d)  $(6 + 3) \cdot 1 + 5 = (6 + 3) + 5$
- (e)  $0 \cdot (6 + 3) + 5 = 0 \cdot 6 + 0 \cdot 3 + 5$
- (f)  $6(3 + 5) = 6(3 + 5 + 0)$
- (g)  $6(3 \cdot 5) + 0 = (6 \cdot 3) \cdot 5 + 0$
- (h)  $6(3 + 5) = 6(3 + 5) \cdot 1$
- (i)  $6 \cdot 3 + (5 + 0) = 6 \cdot 3 + (5 + 0 \cdot 6)$

2. Complete the number sentence  $5(4 + 3) + (2 + 1) + 0 = \underline{\quad ? \quad}$  to demonstrate the property:

- (a) Commutative Property of Multiplication
- (b) Associative Property of Addition
- (c) Identity Property of Addition
- (d) Commutative Property of Addition
- (e) Identity Property of Multiplication
- (f) Distributive Property of Multiplication over Addition
- (g) Zero Property of Multiplication

3. Identify each number sentence as true or false.

- (a)  $6 + 4 \cdot 5 = (6 + 4) \cdot 5$
- (b)  $8 + 6 \div 2 + 1 = 8 + 6 \div (2 + 1)$
- (c)  $24 \div 3 + 5 \cdot 2 = (24 \div 3) + (5 \cdot 2)$
- (d)  $20 + 5(3 + 2) = 20 + 5 \cdot 3 + 2$
- (e)  $2 \cdot 3^2 = 6^2$
- (f)  $12 \div 3 + (7 + 5) = (12 \div 3 + 7) + 5$

4. Place parentheses, if needed, to make each statement true.

- (a)  $4 + 3 \cdot 2 + 1 = 15$
- (b)  $4 + 3 \cdot 2 + 1 = 11$
- (c)  $6 + 3 + 9 \div 3 = 6$
- (d)  $6 + 3 + 9 \div 3 = 10$
- (e)  $3 \times 6 - 2 \div 1 = 12$
- (f)  $3 \times 6 - 2 \div 1 = 16$
- (g)  $7 + 3 \cdot 2^2 - 3 = 40$
- (h)  $7 + 3 \cdot 2^2 - 3 = 37$
- (i)  $7 + 3 \cdot 2^2 - 3 = 10$

1.
  - (a) Commutative property of addition
  - (b) Associative property of addition
  - (c) Commutative property of multiplication
  - (d) Identity property of multiplication
  - (e) Distributive property of multiplication over addition
  - (f) Identity property of addition
  - (g) Associative property of multiplication
  - (h) Identity property of multiplication
  - (i) Zero property of multiplication
2.
  - (a)  $(4 + 3) \cdot 5 + (2 + 1) + 0$
  - (b)  $(5(4 + 3) + 2) + 1 + 0$  or  $5(4 + 3) + 2 + (1 + 0)$
  - (c)  $5(4 + 3) + (2 + 1)$  or  $0 + 5(4 + 3) + (2 + 1) + 0$  or  $5(4 + 3) + 0 + (2 + 1) + 0$   
or  $5(4 + 3) + (2 + 1 + 0) + 0$
  - (d)  $5(3 + 4) + (2 + 1) + 0$  or  $5(4 + 3) + (1 + 2) + 0$  or  $(2 + 1) + 5(4 + 3) + 0$  or  
 $0 + 5(4 + 3) + (2 + 1)$
  - (e)  $1 \cdot 5(4 + 3) + (2 + 1) + 0$  or  $5(4 + 3) \cdot 1 + (2 + 1) + 0$  or  $5(4 + 3) + 1 \cdot (2 + 1) + 0$   
or  $5(4 + 3) + (2 + 1) \cdot 1 + 0$
  - (f)  $5 \cdot 4 + 5 \cdot 3 + (2 + 1) + 0$
  - (g)  $5(4 + 3) + (2 + 1) + 0 \cdot 7$
3.
  - (a) False:  $26 \neq 50$
  - (b) False:  $12 \neq 10$
  - (c) True:  $18 = 18$
  - (d) False:  $45 \neq 37$
  - (e) False:  $18 \neq 36$
  - (f) True:  $16 = 16$
4.
  - (a)  $(4 + 3) \cdot 2 + 1 = 15$
  - (b)  $4 + 3 \cdot 2 + 1 = 11$
  - (c)  $(6 + 3 + 9) \div 3 = 6$
  - (d)  $6 + (3 + 9) \div 3 = 10$
  - (e)  $3 \times (6 - 2) \div 1 = 12$
  - (f)  $3 \times 6 - 2 \div 1 = 16$
  - (g)  $7 + (3 \cdot 2)^2 - 3 = 40$
  - (h)  $(7 + 3) \cdot 2^2 - 3 = 37$
  - (i)  $7 + 3 \cdot (2^2 - 3) = 10$