
[T7-05-10-25]

Alg1PS1

Y A. Rewrite each of the following by using the associative axiom.

[1] $a \times Hb \times cL =$

[2] $Ha \times bL \times c =$

[3] $2 \times Hx \times 7L =$

[4] $3 + H7 + 2L =$

[5] $H2 + pL + 3 =$

[6] $1 \cdot \frac{H}{3} \times pL \times 4 =$

[7] $\frac{H}{2} \times Hx \times 2L =$

[8] $\frac{H}{5} + H2 + xL =$

[9] $\frac{H}{2} \times H3 \times aL =$

Y B. Rewrite each of the following by using the commutative axiom.

[1] $b \times c =$

[2] $a + b =$

[3] $2 \times 7 =$

[4] $p + x =$

[5] $p \times 3 =$

[6] $\frac{H}{3} + p =$

[7] $\frac{H}{2} \times 3 =$

[8] $\frac{H}{5} + x =$

[9] $\frac{1}{2} \times 3 =$

ÿ C. Write the multiplicative inverse of each of the following.

[1] 5

[2] 3

[3] p

[4] $\frac{1}{2}$

[5] 2p

[6] $p \cdot \frac{1}{2}$

[7] a

[8] 3a

[9] $3ap \cdot \frac{1}{2}$

ÿ D. Write the additive inverse of each of the following.

[1] 5

[2] -3

[3] -p

[4] $\frac{1}{2}$

[5] 2p

[6] $-p \cdot \frac{1}{2}$

[7] a

[8] 3a

[9] $-3ap \cdot \frac{1}{2}$

ÿ E. Perform the multiplication in each of the following.

[1] $\frac{1}{5} \times 5 =$

[2] $1 \cdot \frac{1}{5} =$

$$[3] \quad 3 \cdot \frac{1}{3} =$$

$$[4] \quad 1 \cdot \frac{1}{b} b =$$

$$[5] \quad \frac{1}{2} \cdot \frac{1}{2} =$$

$$[6] \quad \frac{1}{3a} \times 3a =$$

$$[7] \quad p \cdot \frac{1}{p} =$$

$$[8] \quad \frac{1}{3ab} 3ab =$$

$$[9] \quad p \cdot \frac{1}{p} =$$

$$[10] \quad 3ap \cdot \frac{1}{3ap} =$$

Y F. Use the axioms associative, commutative, multiplicative inverse and multiplicative identity to show that each of the following statements are true. You may not need to use every axiom in every problem.

è Example. Show that $\frac{1}{2} \times 2 = x$

Solution

$$\begin{aligned}
\text{LHS} &= \cancel{H} \times 2L \\
" &= \cancel{H} 2 \times xL \quad \text{comm} \\
" &= H \cancel{2} \times 2Lx \quad \text{assoc} \\
" &= 1 \times x \quad \text{inv } x \\
" &= x \quad \text{id } x \\
" &= \text{RHS} \\
\backslash \cancel{H} \times 2L &= x
\end{aligned}$$

[1] Show that $\cancel{H} \times 3L = x$

[2] Show that $H \cancel{10} \times L \cancel{10} = x$

[3] Show that $\cancel{H} \times pL = x$

[4] Show that $\cancel{H} \times 2 \cdot \cancel{2} M = x$

[5] Show that $\frac{d}{dx} ax = x$

[6] Show that $\frac{d}{dx} p^3 \cdot \frac{d}{dx} x = x$

Y G. Rewrite each of the following equations by using Theorem G1 and multiplication, together with appropriate axioms and definitions. Simplify both sides of the resulting equation as shown in the following example.

è Example. $3x = 6$, multiply by 2.

Solution

$$\begin{array}{l} 3x = 6 \\ \text{" } 2H3xL = 2H6L \quad \text{G1} \\ \text{" } H2 \times 3Lx = 2H6L \quad \text{assoc} \\ \text{" } 6x = 2H6L \quad \text{arith} \\ \text{" } 6x = 12 \quad \text{arith} \\ \backslash \quad 6x = 12 \end{array}$$

[1] $2x = 7$, multiply by 5.

[2] $4x = 5$, multiply by 3.

[3] $px = 3$, multiply by 2.

[4] $3x = 12$, multiply by $\frac{1}{3}$.

ÿ H. Solve each of the following for the unknown x.

è Example 1. Solve $3x = 6$ for x.

Solution

$$\begin{array}{l}
 3x = 6 \\
 " \quad \frac{1}{3} \cdot 3x = \frac{1}{3} \cdot 6 \quad G1 \\
 " \quad 1x = 2 \quad \text{arith} \\
 " \quad x = 2 \quad \text{arith}
 \end{array}$$

Check conclusion

$$\begin{array}{l}
 \text{LHS} = 3 \cdot 2 \\
 " = 6 \\
 " = \text{RHS}
 \end{array}$$

[1] $5x = 15$

[2] $3x = 21$

$$[3] \quad 2x = 3$$

$$[4] \quad 3x = 2$$

$$[5] \quad 3x = \frac{3}{2}$$

$$[6] \quad x \frac{3}{2} = 7$$

Answers to Alg1PS1

Y A. Rewrite each of the following by using the associative axiom.

- [1] $a \times b \times c$ [2] $a \times b \times c$ [3] $2 \times 3 \times 7$ [4] $3 + 7 + 2$ [5] $2 + p + 3$
 [6] $3 \times p \times 4$ [7] $1 \times 2 \times 3$ [8] $1 \times 2 + x$ [9] $3 \times 3 \times a$

Y B. Rewrite each of the following by using the commutative axiom.

- [1] $c \times b$ [2] $b + a$ [3] 7×2 [4] $x + p$ [5] $3p$
 [6] $p + 3$ [7] 3×2 [8] $x + 5$ [9] 3×2

Y C. Write the multiplicative inverse of each of the following.

- [1] $\frac{1}{5}$ [2] $\frac{1}{3}$ [3] $\frac{1}{6}$ [4] $\frac{1}{2}$ [5] $\frac{1}{2b}$
 [6] $\frac{1}{p \cdot 2}$ [7] $\frac{1}{a}$ [8] $\frac{1}{3a}$ [9] $\frac{1}{3ap \cdot 2}$

Y D. Write the additive inverse of each of the following.

- [1] -5 [2] 3 [3] p [4] -2^2 [5] $-2p$ [6] $p \cdot 2^2$
 [7] $-a$ [8] $-3a$ [9] $3ap \cdot 2^2$

Y E. Perform the multiplication in each of the following.

The answer to every question in this section is 1.

Y H. Solve each of the following for the unknown x.

- [1] $5x = 15 \Rightarrow x = 3$ [2] $3x = 21 \Rightarrow x = 7$ [3] $2x = 3 \Rightarrow x = \frac{3}{2}$
 [4] $3x = 2 \Rightarrow x = \frac{2}{3}$ [5] $3x = 2^2 \Rightarrow x = \frac{2^2}{3}$ [6] $x \cdot 2^2 = 7 \Rightarrow x = \frac{7}{2^2}$
 [7] $px = 5 \Rightarrow x = \frac{5}{p}$ [8] $x \cdot 2^2 = p \Rightarrow x = \frac{p}{2^2}$ [9] $2px = 6 \Rightarrow x = \frac{3}{p}$