

1. Name the number law illustrated by each of the following sentences.

(a) $2 + 3 = 3 + 2$ (c) $3 + (2 + 5) = (3 + 2) + 5$ (e) $(9 \times 4) \times 3 = 9 \times (4 \times 3)$	(b) $(2 + 7) + 3 = 2 + (7 + 3)$ (d) $7 \times 8 = 8 \times 7$ (f) $7 \times (8 \times 5) = (7 \times 8) \times 5$
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2. Express each of the following in the form of $(a \times b) + (a \times c)$ or $(b \times a) + (c \times a)$.

(a) $3 \times (4 + 5)$ (d) $(5 + 2) \times 4$	(b) $3 \times (7 + 2)$ (e) $(3 + 1) \times 7$	(c) $3 \times (8 + 4)$ (f) $(7 + 4) \times 11$
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3. Copy and complete the following sentences.

(a) $3 \times \underline{\hspace{1cm}} = 7 \times 3$ (b) $(7 \times 8) \times 3 = \underline{\hspace{1cm}} \times (8 \times 3)$ (c) $5 + \underline{\hspace{1cm}} = 6 + 5$ (d) $\underline{\hspace{1cm}} \times (10 + 3) = (2 \times 10) + (2 \times 3)$ (e) $(58 + \underline{\hspace{1cm}}) \times 4 = (58 \times 4) + (20 \times 4)$ (f) $(3 + 4) + \underline{\hspace{1cm}} = 3 + (4 + 5)$	
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4. Consider the following groups of statements. Check whether they are true, and then write a general statement for each group.

(a) $5 \times 1 = 1 \times 5 = 5$ $3 \times 1 = 1 \times 3 = 3$ $25 \times 1 = 1 \times 25 = 25$	(b) $8 + 0 = 0 + 8 = 8$ $5 + 0 = 0 + 5 = 5$ $11 + 0 = 0 + 11 = 11$
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5. By inspection, match each expression in column A with one in column B. Give your reason.

For example, (a) is equal to (i) by the associative law of addition.

Column A	Column B
(a) $(3 + 2) + 4$	(i) $3 + (2 + 4)$
(b) $5 + (3 + 2)$	(ii) $(4 + 7) \times 2$
(c) $4 \times (3 + 7)$	(iii) $4 \times (6 + 3)$
(d) $(6 + 3) \times 4$	(iv) $5 + (2 + 3)$
(e) $(7 + 4) \times 2$	(v) $(1 + 2) \times 3 + (1 + 2) \times 4$
(f) $(9 \times 3) \times 2$	(vi) $(5 + 4) \times (3 \times 2)$
(g) $(1 + 2) \times (3 + 4)$	(vii) $(4 \times 3) + (4 \times 7)$
(h) $[(5 + 4) \times 3] \times 2$	(viii) $9 \times (3 \times 2)$
(i) $(5 + 3) + 6$	(ix) $6 + (5 + 3)$
(j) $12 + (3 + 5)$	(x) $(12 + 3) + 5$