7 How to • • • • • Apply Properties in Multiplication

Facts to Know

Commutative Property

The Commutative Property of Multiplication states that when the order of the factors is changed, the product stays the same. Multiplication is a commutative operation. In the equation 2 x 4 = 4 x 2, for example, the order of the factors does not affect the answer (4 x 2 = 8 and 2 x 4 = 8).

The commutative property works for any number of factors. Study the following samples:

Sample A

5 x 6 x 7 = 7 x 6 x 5
5 x 6 x 7 = 210
7 x 6 x 5 = 210

Sample B

$$\begin{array}{r} 70 \\ \times\ 90 \\ \hline 6{,}300 \end{array} \qquad \begin{array}{r} 90 \\ \times\ 70 \\ \hline 6{,}300 \end{array}$$

Sample C

30 x 50 = 50 x 30
30 x 50 = 1,500
50 x 30 = 1,500

Associative Property

The Associative Property of Multiplication states that when the grouping of the factors is changed, the product stays the same. Multiplication is associative. The way the factors are grouped with parentheses does not affect the answer. Study the following samples:

Sample D

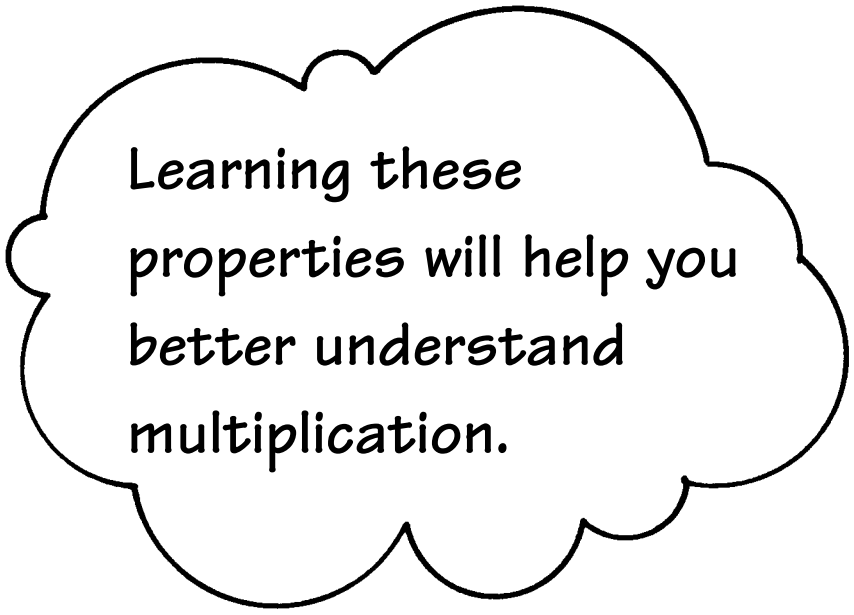
2 x (3 x 4) = (2 x 3) x 4
2 x (3 x 4) = 24
(2 x 3) x 4 = 24

Sample E

6 x (7 x 9) = (6 x 7) x 9
6 x (7 x 9) = 378
(6 x 7) x 9 = 378

Sample F

4 x (5 x 6) = (4 x 5) x 6
4 x (5 x 6) = 120
(4 x 5) x 6 = 120



7 Practice • • • • • • Using the Commutative Property with Two Factors

Directions: Use the information on page 29 to help you complete the problems below.

1. 5 x 8 = _____ **2.** 8 x 5 = _____ **3.** 9 x 6 = _____

4. 6 x 9 = _____ **5.** 7 x 8 = _____ **6.** 8 x 7 = _____

7. 12 x 7 **8.** 7 x 12 **9.** 15 x 8 **10.** 8 x 15

11. 18 x 7 **12.** 7 x 18 **13.** 20 x 9 **14.** 9 x 20

15. 19 x 6 **16.** 6 x 19 **17.** 17 x 7 **18.** 7 x 17

Directions: Complete these two-digit times two-digit problems. Remember to regroup where necessary. Check your work. Each pair of answers should be the same.

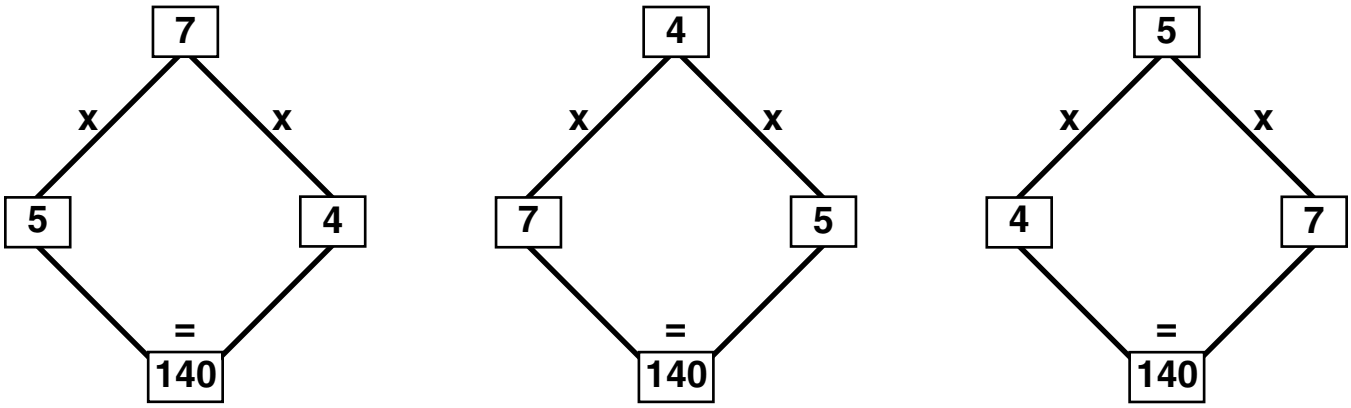
19. 90 x 80 **20.** 80 x 90 **21.** 60 x 70 **22.** 70 x 60

23. 40 x 90 **24.** 90 x 40 **25.** 80 x 70 **26.** 70 x 80

27. 25 x 30 **28.** 30 x 25 **29.** 65 x 40 **30.** 40 x 65

7 Practice • • • • • • Using the Commutative Property with Three or More Factors

Study this example.



Batter up! Who's on first? Who's on second? Who's on third? It doesn't matter. The score is the same!

4 x 7 x 5 = 140 **5 x 4 x 7 = 140** **7 x 5 x 4 = 140**

Directions: Use the information on page 29 and the example above to help you complete the problems on this page. Check your work. Each set of three problems should have the same answers.

1. 7 x 4 x 8 = _____ **5.** 8 x 4 x 7 = _____ **9.** 4 x 7 x 8 = _____

2. 6 x 3 x 4 = _____ **6.** 4 x 6 x 3 = _____ **10.** 3 x 6 x 4 = _____

3. 5 x 9 x 3 = _____ **7.** 3 x 9 x 5 = _____ **11.** 9 x 3 x 5 = _____

4. 5 x 10 x 9 = _____ **8.** 9 x 10 x 5 = _____ **12.** 10 x 5 x 9 = _____

Directions: Complete these problems. Notice which answers are the same.

13. 5 x 6 x 7 x 8 = _____ **19.** 5 x 9 x 7 x 2 = _____

14. 8 x 7 x 6 x 5 = _____ **20.** 7 x 9 x 2 x 5 = _____

15. 6 x 5 x 8 x 7 = _____ **21.** 10 x 11 x 9 x 8 = _____

16. 7 x 8 x 6 x 5 = _____ **22.** 8 x 10 x 11 x 9 = _____

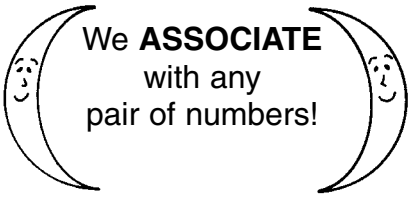
17. 2 x 5 x 7 x 9 = _____ **23.** 11 x 10 x 8 x 9 = _____

18. 9 x 7 x 5 x 2 = _____ **24.** 9 x 10 x 8 x 11 = _____

7 Practice • • • • • • • Using the Associative Property

$3 \times (4 \times 5) = \underline{60}$

$(3 \times 4) \times 5 = \underline{60}$



Directions: Use the information on page 29 and the example above to help you complete these problems.

1. 4 x (5 x 6) = _____

2. (4 x 5) x 6 = _____

3. 7 x (8 x 9) = _____

4. (7 x 8) x 9 = _____

5. (4 x 6) x 2 = _____

6. 4 x (6 x 2) = _____

7. (9 x 4) x 7 = _____

8. 9 x (4 x 7) = _____

9. 3 x (5 x 9) = _____

10. (3 x 5) x 9 = _____

Directions: Try these problems. Use the ladder form where needed to do the operation. Review the information on page 17 to multiply by multiples of 10.

11. (20 x 30) x 40 = _____

12. 20 x (30 x 40) = _____

13. (70 x 90) x 30 = _____

14. 70 x (90 x 30) = _____

15. 50 x (30 x 80) = _____

16. (50 x 30) x 80 = _____

17. (25 x 40) x 60 = _____

18. 25 x (40 x 60) = _____

19. (35 x 25) x 10 = _____

20. 35 x (25 x 10) = _____

Page 26
1. 735
2. 903
3. 943
4. 1,428
5. 1,188
6. 2,739
7. 1,395
8. 3,417
9. 3,869
10. 3,977
11. 4,615
12. 5,828
13. 1,219
14. 3,567
15. 1,008
16. 4,316
17. 3,608
18. 7,708
19. 1,476
20. 4,819

Page 27
1. 1,600
2. 2,142
3. 3,116
4. 3,115
5. 2,432
6. 1,634
7. 5,980
8. 864
9. 1,560
10. 2,115
11. 2,376
12. 4,482
13. 3,942
14. 2,478
15. 2,214
16. 990
17. 2,275
18. 3,267
19. 2,001
20. 3,354

Page 28
1. 5,850
2. 6,762
3. 3,956
4. 7,722
5. 4,355
6. 3,422
7. 3,724
8. 8,514
9. 4,950
10. 6,776
11. 4,235
12. 7,623

Page 30
1. 40
2. 40
3. 54
4. 54
5. 56
6. 56
7. 84
8. 84
9. 120
10. 120
11. 126
12. 126
13. 180
14. 180
15. 114
16. 114
17. 119
18. 119
19. 7,200
20. 7,200
21. 4,200
22. 4,200
23. 3,600
24. 3,600
25. 5,600
26. 5,600
27. 750
28. 750
29. 2,600
30. 2,600

Page 31
1. 224
2. 224
3. 224
4. 72
5. 72
6. 72
7. 135
8. 135
9. 135
10. 450
11. 450
12. 450
13. 1,680
14. 1,680
15. 1,680
16. 1,680
17. 630
18. 630
19. 630
20. 630
21. 7,920
22. 7,920
23. 7,920
24. 7,920

Page 32
1. 120
2. 120
3. 504
4. 504
5. 48
6. 48
7. 252
8. 252
9. 135
10. 135
11. 24,000
12. 24,000
13. 189,000
14. 189,000
15. 120,000
16. 120,000
17. 60,000
18. 60,000
19. 8,750
20. 8,750

Page 34
1. 7,744
2. 9,801
3. 4,356
4. 5,929
5. 4,761
6. 3,481
7. 6,241
8. 7,921
9. 6,084
10. 7,569
11. 2,401
12. 4,489

Page 35
1. 13,860
2. 67,355
3. 32,384
4. 3,161
5. 47,235
6. 28,504
7. 33,633
8. 22,568
9. 61,028
10. 44,394
11. 35,992
12. 31,473
13. 3,663
14. 2,442
15. 12,210
16. 14,652

Page 36
Actual Products
1. 2,511
2. 1,479
3. 1,800
4. 1,056
5. 4,346
6. 142,175
7. 299,530
8. 504,432

Page 38
1. 1, 2, 4
2. 1 ,2
3. 1, 5
4. 1, 2, 4, 8
5. 1, 2, 5, 10
6. 1, 2, 3, 4, 6, 12
7. 1, 2
8. 1, 2, 4
9. 6: 1, 2, 3, 6 10: 1, 2, 5, 10 CF: 1, 2
10. 9: 1, 3, 9 18: 1, 2, 3, 6, 9, 18 CF: 1, 3, 9
11. 12: 1, 2, 3, 4, 6, 12 16: 1, 2, 4, 8, 16 CF: 1, 2, 4
12. 7: 1, 7 14: 1, 2, 7, 14 CF: 1, 7
13. 10: 1, 2, 5, 10 30: 1, 2, 3, 5, 6, 15, 30 CF: 1, 2, 5
14. 24: 1, 2, 3, 4, 6, 12, 24 30: 1, 2, 3, 5, 6, 15, 30 CF: 1, 2, 3, 6
15. 32: 1, 2, 4, 8, 16, 32 16: 1, 2, 4, 8, 16 CF: 1, 2, 4, 8, 16
16. 48: 1, 2, 3, 4, 6, 8, 12, 18, 24, 48 36: 1, 2, 3, 4, 6, 9, 12, 18, 36 CF: 1, 2, 3, 4, 6, 12, 18
17. 36: 1, 2, 3, 4, 6, 9, 12, 18, 36 18: 1, 2, 3, 6, 9, 18 CF: 1, 2, 3, 6, 9, 18
18. 18: 1, 2, 3, 6, 9, 18 12: 1, 2, 3, 4, 6, 12, 18 CF: 1, 2, 3, 6
19. 6: 1, 2, 3, 6 12: 1, 2, 3, 4, 6, 12 18: 1, 2, 3, 6, 9, 18 C.F. 1, 2, 3, 6
20. 9: 1, 3, 9 12: 1, 2, 3, 4, 6, 12 24: 1, 2, 3, 4, 6, 8, 12, 24 1, 3
21. 10: 1, 2, 5, 10 15: 1, 3, 5, 15 25: 1, 5, 25 C.F. 1, 5
22. 16: 1, 2, 4, 8, 16 24: 1, 2, 3, 4, 6, 8, 12, 24 36: 1, 2, 3, 4, 6, 9, 12, 18, 36 C.F. 1, 2, 4

Page 39
1. 3: 3, 6, 9, 12, 15, 18/2: 2, 34, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24 CM: 6, 12, 18
2. 4: 4, 8, 12,16, 20, 24/2: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24 CM: 4, 8, 12, 16, 20, 24
3. 6: 6, 12, 18, 24/8: 8, 16, 24 CM: 24
4. 9: 9, 18, 27, 36 6: 6, 12, 18, 24, 36 CM: 18, 36
5. 9: 9, 18, 27, 36/4: 4, 8, 12,16, 20, 24 CM: 36
6. 12: 12, 24, 36/9: 9, 18, 27, 36 CM: 36
7. 9:9, 18, 27, 36, 45, 54 3: 3, 6, 9, 12, 15, 18 CM: 9
8. 12: 12, 24, 36, 48, 60, 72 10: 10, 20, 30, 40, 50, 60 CM: 60
9. 10: 10, 20, 30, 40, 50, 60 5: 5, 10, 15, 20, 25, 30 CM: 30
10. 3: 3, 6, 9, 12, 15, 18/12: 12, 24, 36, 48, 60, 72 CM: 12

Page 40
1. 16
2. 25
3. 2, 2, 4
4. 3, 3, 9
5. 6, 6, 36
6. 8, 8, 64
7. 10, 10, 100
8. 9, 9, 81
9. 7, 7, 49
10. 12, 12, 144
11. 4, 8, 8
12. 9, 27, 27
13. 4, 4, 16/ 16, 4, 64/64
14. 6, 6, 36 36, 6, 216/216
15. 7, 7, 49/ 49, 7, 343/343
16. 9, 9, 81/ 81, 9, 729/ 729
17. 5, 5, 25/25, 5, 125/125
18. 8, 8, 64/64, 8, 512/512
19. 10, 10, 100/ 100, 10, 1,000/ 1,000
20. 12, 12, 144/ 144, 12, 1,728/1,728

Page 41
Lizard Lore
1. 32 inches
2. 63 inches
3. 72 eggs
4. 54 eggs
5. 200 inches
6. 135 eggs
7. 115 cm
8. 104 cm
9. 200 cm
10. 108 eggs

Tree Tales
1. 200 feet
2. 1,500 cm
3. 12,000 mm
4. 2,000 cm
5. 600 cm
6. 900 cm
7. 1,200 cm
8. 20 cm
9. 900 cm
10. 2,300 cm

Page 42
Buggy Facts
1. 1,500 eggs
2. 18,000 times
3. 475 cm
4. 7,300 species
5. 750 mm
6. 21,000 eggs
7. 1,840 miles
8. 12,500 eggs
9. 5,250 aphids
10. 416 spots

Body Stuff
1. 5,400 times / 129,600 times
2. 5,760 quarts / 87,600 quarts
3. 17,520 ounces / 1,226,400 ounces
4. 3,500,000 hairs / 50,000,000 hairs
5. 5,150 bones
6. 4,320 ounces

Page 43
1. 15 gallons / 5,475 gallons
2. 10,950 gallons / 219,000 gallons
3. 1,825 gallons / 36,500 gallons
4. 520 gallons / 7,800 gallons
5. 7,300 gallons / 365 gallons

Page 44
1. 12,775 gallons / 210 gallons / 76,650 gallons
2. 5,475 gallons / 90 gallons / 32,850 gallons
3. 24 gallons / 168 gallons / 8,760 gallons
4. 840 gallons / 43,800 gallons

