

Activity: Order of Operations – Pair, Then Share

Work with a partner to determine the keystrokes you use with the *fx-260* scientific calculator to produce the given solution. Your teacher will assign some of the problems below for you and your partner to solve.

Figure out the correct way to enter the following problems into the *fx-260* scientific calculator to display these solutions. Check your answers with your *fx-260* scientific calculator.

Problem	Keystrokes	Solution
1. $(18 - 9) \times 6$		54
2. $56 + 6 \div 2$		59
3. $(-4 - 4)^2$		64
4. $60 \div (12 - 24)$		-5
5. $(-6 + -10) \div -2$		8
6. $-32 \div 8$		-4
7. $(-9 * -9) - 9$		72
8. $(-15 * -2) + -12$		18
9. $(-4)(-7)$		28
10. $(3 - 5)(3)$		-6
11. $6(-5)^2$		900
12. $3 + 7^2$		52
13. $-6 - (-7)$		1
14. $(7 + 3) * (3 + 5)$		80
15. $12 + (9 * 2)$		30
16. $28 \div (10 - 6)$		7
17. $5 + 4 * 3$		17
18. $7^2 - 9$		40
19. $7^2 \div 7 * 1$		7
20. $(42 \div -7) - 6$		-12
21. $(-30 + -20) \div 2$		-25
22. $(5 - 6) * 25$		-25
23. $(-18 \div 3) + 76$		70
24. $7 - 2^2$		3
25. $9(15 \div 3)$		45
26. $(64 \div -8)5$		-40
27. $5^2 + (8 * 2)$		41
28. $(6^2 - 8)2$		56
29. $-4 - 4 - 4 - 4$		-16
30. $(20 - 4) \div (12 - 4)$		2
31. $\sqrt{64} + (10 - 12)$		6
32. $\sqrt{4}(-9)$		-18

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Objective: To develop a user's ability to enter expressions using an *fx260* scientific calculator's first and 2nd function keys by practicing order of operations problems.

Grade Level: Middle School

Topic: Problem Solving/Order of Operations

Using the Activity:

The *fx-260* scientific calculator possesses algebraic logic. Hence, when evaluating expressions, a user may enter an expression as written to determine a solution. A user does not need to know Order of Operations to enter and obtain the solution, but the user should understand this process to verify the solution obtained.

In this activity, students are given an expression and the correct answer for the simplification of the expression using operational order. Students are asked to determine how the expression should be entered into the *fx-260* scientific calculator to produce the correct solution.

A comparison to a four-function calculator is helpful in extending students understanding of how the *fx-260* scientific calculator differs in its ability to process number and operational information. A discussion of these differences may help students understand and appreciate the value the scientific calculator has in helping them compute more complicated expressions. Determining the number of key strokes for each calculator and the order in which they are completed will help students understand when a scientific calculator is preferred for use in problem solving versus the relevance of using a four-function calculator for more basic operational tasks.

Procedure: Assign students a partner to work with, and assign each team ten problems from the chart to complete. Teams can receive the same ten problems or you may assign different problems to different teams. Students should record their keystroke solutions on their paper. Provide time for each team to work with each other and their calculators to record their results. Next, call on teams to present their solutions to another pair of students or to the entire class. Reserve a few problems as extra credit or students may continue the assignment as homework by completing the remaining unsolved problems.

Extension: Ask student teams while completing their ten assigned problems (or as part of the homework assignment) to create five problems of their own, providing the problem, solution, and keystrokes for the *fx-260*. Use these problems for additional practice.

Problem	Keystrokes	Solution
1. $(18 - 9) \times 6$	$(1 8 - 9) \times 6 =$	54
2. $56 + 6 \div 2$	$5 6 + 6 \div 2 =$	59
3. $(-4 - 4)^2$	$(4 +/- - 4) x^2$	64
4. $60 \div (12 - 24)$	$6 0 \div (1 2 - 2 4) =$	-5
5. $(-6 + -10) \div -2$	$(6 +/- + 1 0 +/-) \div 2 +/- =$	8
6. $-32 \div 8$	$3 2 +/- \div 8 =$	-4
7. $(-9 * -9) - 9$	$(9 +/- \times 9 +/-) - 9 =$	72

8. $(-15 * -2) + -12$	$(15 +/- \times 2 +/-) + 12 +/- =$	18
9. $(-4)(-7)$	$(4 +/-) \times (7 +/-) =$	28
10. $(3-5)(3)$	$(3-5) 3 =$	-6
11. $6(-5)^2$	$6 \times (5 +/-) = x^2$	900
12. $3+7^2$	$3+7 x^2 =$	52
13. $-6-(-7)$	$6 +/- - (7 +/-) =$	1
14. $(7+3)*(3+5)$	$(7+3) \times (3+5) =$	80
15. $12+(9*2)$	$12+(9 \times 2) =$	30
16. $28 \div (10-6)$	$28 \div (10-6) =$	7
17. $5+4*3$	$5+4 \times 3 =$	17
18. 7^2-9	$7 x^2 - 9 =$	40
19. $7^2 \div 7 * 1$	$7 x^2 \div 7 \times 1 =$	7
20. $(42 \div -7) - 6$	$(42 \div 7 +/-) - 6 =$	-12
21. $(-30 + -20) \div 2$	$(30 +/- + 20 +/-) \div 2 =$	-25
22. $(5-6)*25$	$(5 +/- - 6) \times 25 =$	-25
23. $(-18 \div 3) + 76$	$(18 +/- \div 3) + 76 =$	70
24. $7-2^2$	$7-2 x^2 =$	3
25. $9(15 \div 3)$	$9 \times (15 \div 3) =$	45
26. $(64 \div -8)5$	$(64 \div 8 +/-) \times 5 =$	-40
27. $5^2 + (8*2)$	$5 x^2 + (8 \times 2) =$	41
28. $(6^2 - 8)2$	$(6 x^2 - 8) \times 2 =$	56
29. $-4-4-4-4$	$4 +/- - 4 - 4 - 4 =$	-16
30. $(20-4) \div (12-4)$	$(20-4) \div (12-4) =$	2
31. $\sqrt{64} + (10-12)$	$64 \text{ shift } \sqrt{\quad} + (10-12) =$	6
32. $\sqrt{4}(-9)$	$4 \text{ shift } \sqrt{\quad} \times 9 +/- =$	-18

