

## All-Star Contest

## RADICAL

PROBLEM: Given an expression in radical form, simplify the expression and perform indicated operations.

Input: There will be 10 inputs. The first five will contain just one radical expression to be simplified. The last 5 inputs will contain two radical expressions and an operation symbol (+, -, \*, or /). Each expression will be entered in the form of 3 integers: A, B, C that will form the expression:

$$A + B \cdot \sqrt{C}$$

The rules for radical simplification are:

1. A radicand may not contain a perfect root factor
2. A radicand may not be negative

The following are the results of the Sample Input below:

1.  $5 + 2 \cdot \sqrt{20} = 5 + 2\sqrt{4} \cdot \sqrt{5} = 5 + 2 \cdot 2\sqrt{5} = 5 + 4 \cdot \sqrt{5} = 5, 4, 5$
2.  $5 + 2 \cdot \sqrt{-20} = 5 + 2 \cdot \sqrt{-1} \cdot \sqrt{4} \cdot \sqrt{5} = 5 + 4 \cdot i \cdot \sqrt{5} = 5, 4i, 5$
3.  $1 + 2 \cdot \sqrt{4} = 1 + 4 = 5 = 5, 0, 0$
4.  $1 + 2 \cdot \sqrt{-4} = 1 + 4i = 1, 4i, 0$
6.  $0 + 4 \cdot \sqrt{3} + 0 + 5 \cdot \sqrt{3} = 0 + 9 \cdot \sqrt{3} = 0, 9, 3$
7.  $1 + 2 \cdot \sqrt{3} - (2 + 3\sqrt{3}) = 1 + 2 \cdot \sqrt{3} - 2 - 3 \cdot \sqrt{3} = -1 - 1 \cdot \sqrt{3} = -1, -1, 3$
8.  $(2 + 2\sqrt{3})(3 + 3 \cdot \sqrt{3}) = 6 + 12\sqrt{3} + 18 = 24 + 12 \cdot \sqrt{3} = 24, 12, 3$
9.  $\frac{2 + 2 \cdot \sqrt{2}}{3 - 2 \cdot \sqrt{2}} = \frac{2 + 2 \cdot \sqrt{2}}{3 - 2 \cdot \sqrt{2}} \cdot \frac{3 + 2 \cdot \sqrt{2}}{3 + 2 \cdot \sqrt{2}} = 14 + 10 \cdot \sqrt{2} = 14, 10, 2$

Output: Perform all indicated operations and simplify each expression. We guarantee that all solutions will be in the form  $A + B \cdot \sqrt{C}$  and will be printed in the form A, B, C or A, Bi, C. Note that when B or C equal 0, it indicates a lack of a radical in the solution.

## SAMPLE INPUT

1. 5, 2, 20
2. 5, 2, -20
6. 0, 4, 3, 0, 5, 3, +
7. 1, 2, 3, 2, 3, 3, -
8. 2, 2, 3, 3, 3, 3, \*
9. 2, 2, 2, 3, -2, 2, /

## SAMPLE OUTPUT

1. 5, 4, 5
2. 5, 4i, 5
6. 0, 9, 3
7. -1, -1, 3
8. 24, 12, 3
9. 14, 10, 2