PROBLEMS INVOLVING PERCENT INCREASE AND DECREASE

- Want more practice with percents and related concepts?
  Changing Decimals to Percents
  Changing Percents to Decimals
  Writing Expressions Involving Percent Increase and Decrease
  Calculating Percent Increase and Decrease
  More Problems Involving Percent Increase and Decrease

(more mathematical cats)

Here, you will practice solving problems involving percent increase and decrease.

You may use a calculator for these exercises.

EXAMPLES:

Question:
Suppose an item costs $\$50$.
If the price increases by 19%, and then decreases by 30%, the new price is:

Solution:
$(0.7)(1.19)(\$50) = \$41.65$
Why?

To increase ***any*** amount by 19%, just multiply by 1.19:
$x + 0.19x = 1x + 0.19x = 1.19x$
Notice that when you ***increase***, you multiply by a number greater than 1.

If you decrease ***any*** amount by 30%, then 70% remains:
$x - 0.3x = 1x - 0.3x = 0.7x$
Thus, to decrease ***any*** amount by 30%, just multiply by 0.7.

Notice that when you ***decrease***, you multiply by a number less than 1.

Combining these ideas:

$\$50$	(original amount)
$(1.19)(\$50)$	(new amount, after the 19% increase)
$(0.7) \cdot (1.19)(\$50)$	(new amount, after the 30% decrease)
$(0.7)(1.19)(\$50) = \$41.65$	(round dollar amounts (as needed) to two decimal places)

What if we switch the order of applying the increase/decrease?

$\$50$	(original amount)
$(0.7)(\$50)$	(new amount, after the 30% decrease)
$(1.19) \cdot (0.7)(\$50)$	(new amount, after the 19% increase)
$(1.19)(0.7)(\$50) = \$41.65$	(round dollar amounts (as needed) to two decimal places)

Same result!
Since $(1.19)(0.7) = (0.7)(1.19)$, you can do the multiplication in whatever order you prefer.

Question:
Suppose an item costs x.
If the price decreases by 38%, and then increases by 85%, the new price is:
Answer:
$(1 + 0.85)(1 - 0.38)(x) = (1.85)(0.62)x = 1.15x$
In this exercise, all answers are rounded to two decimal places.

Question:
Suppose an item costs x.
If the price decreases by 50%, and then increases by 50%, the new price is:
Answer:
$(1.5)(0.5)(x) = 0.75x$

Question:
Suppose an item costs x.
If the price increases by 50%, and then increases by 50%, the new price is:
Answer:
$(1.5)(1.5)(x) = 2.25x$

Question:
Suppose an item costs $\$100$.
If the price decreases by 50%, and then decreases by 50%, the new price is:
Answer:
$(0.5)(0.5)(x) = \$25.00$