```
        (5 dollars — 4 dollars)
        ----------------------- x 100
               4 dollars
```

which yields

```
           1
        ----- x 100
           4
```

or

```
           25%
```

This is a percentage increase of 25 percent.

Distinguishing between percentage changes and percentage point changes

In Example 1 we were dealing with a percentage change of a quantity expressed in dollars; however, there are times when we want to talk about a percentage change in a quantity already expressed as a percentage, such as the unemployment rate, or an interest rate.   The fact that the original quantity is expressed as a percentage introduces an ambiguity. Consider the following example.

Example 2:
Suppose you have a student loan with an annual interest rate of 4 percent. One day your lender announces that the interest rate will soon increase to an annual rate of 5 percent.

Here is a question: what is the percentage increase in your interest rate?

Unfortunately, this question is a bit ambiguous. The simple answer *seems* to be that the interest rate increases by 1 percent (which is 5 percent minus 4 percent). Yet if you think about it a little further, it would be very misleading to call this a 1 percent increase. In fact, it is analogous to the case we discussed in Example 1. Recall that in Example 1, we found that an increase from 4 dollars per bushel to 5 dollars per bushel represented a 25 percent increase. Likewise, here we can say that an increase from 4 percent to 5 percent represents a 25 percent increase.

To clear up the ambiguity, we erect a distinction between **percentage point change** and **percentage change**.   The distinction runs as follows.

The **percentage point** change is simply the difference between the final and initial values (using the example above, 5 percent minus 4 percent yields an increase of 1 percentage point). The **percentage** change is the difference between the final and initial values divided by the initial value (using the example above, we take the difference of 1 percent and divide it by 4 percent, which yields an increase of 25 percent).