

Pre-Algebra

Applying a Percent Decrease

It is common in mathematics to work with percent decreases. In a store you may see a sign that says “Sale – 40% off.” In such a case, you may want to calculate the sale price.

Applying a Percent Decrease

There are two methods for working with percent decreases. Use the one you like best.

Method 1:

- Start with the amount before decrease (i.e., the original amount).
- Calculate the amount of the decrease.
- Subtract the amount of the decrease from the original amount to obtain the final amount.

$$\left(\begin{array}{c} \text{decrease} \\ \text{amount} \end{array} \right) = \left(\begin{array}{c} \text{original} \\ \text{amount} \end{array} \right) \cdot \left(\begin{array}{c} \text{percent} \\ \text{decrease} \end{array} \right)$$

$$\left(\begin{array}{c} \text{final} \\ \text{amount} \end{array} \right) = \left(\begin{array}{c} \text{original} \\ \text{amount} \end{array} \right) - \left(\begin{array}{c} \text{decrease} \\ \text{amount} \end{array} \right)$$

An advantage of this approach is that you calculate the amount of the decrease. Sometimes, this is an important value to know (e.g., how much money did you save?).

Example: What do you get when you decrease 150 by 40%?

$$\text{Decrease Amount} = 40\% \cdot 150 = 60$$

$$\text{Final Amount} = 150 - 60 = 90$$

Method 2:

- Subtract the percent increase from 100%.
- Multiply the original amount by this new percentage to obtain the final amount.

$$\left(\begin{array}{c} \text{total} \\ \text{percent} \end{array} \right) = 100\% - \left(\begin{array}{c} \text{percent} \\ \text{decrease} \end{array} \right)$$

$$\left(\begin{array}{c} \text{final} \\ \text{amount} \end{array} \right) = \left(\begin{array}{c} \text{original} \\ \text{amount} \end{array} \right) \cdot \left(\begin{array}{c} \text{total} \\ \text{percent} \end{array} \right)$$

This approach may be easier and has the same form as the formula for percent increase. It also has extensive business applications.

Example: What do you get when you decrease 150 by 40%?

$$\text{Total Percent} = 100\% - 40\% = 60\% = 0.6$$

$$\text{Final Amount} = 150 \cdot 0.6 = 90$$