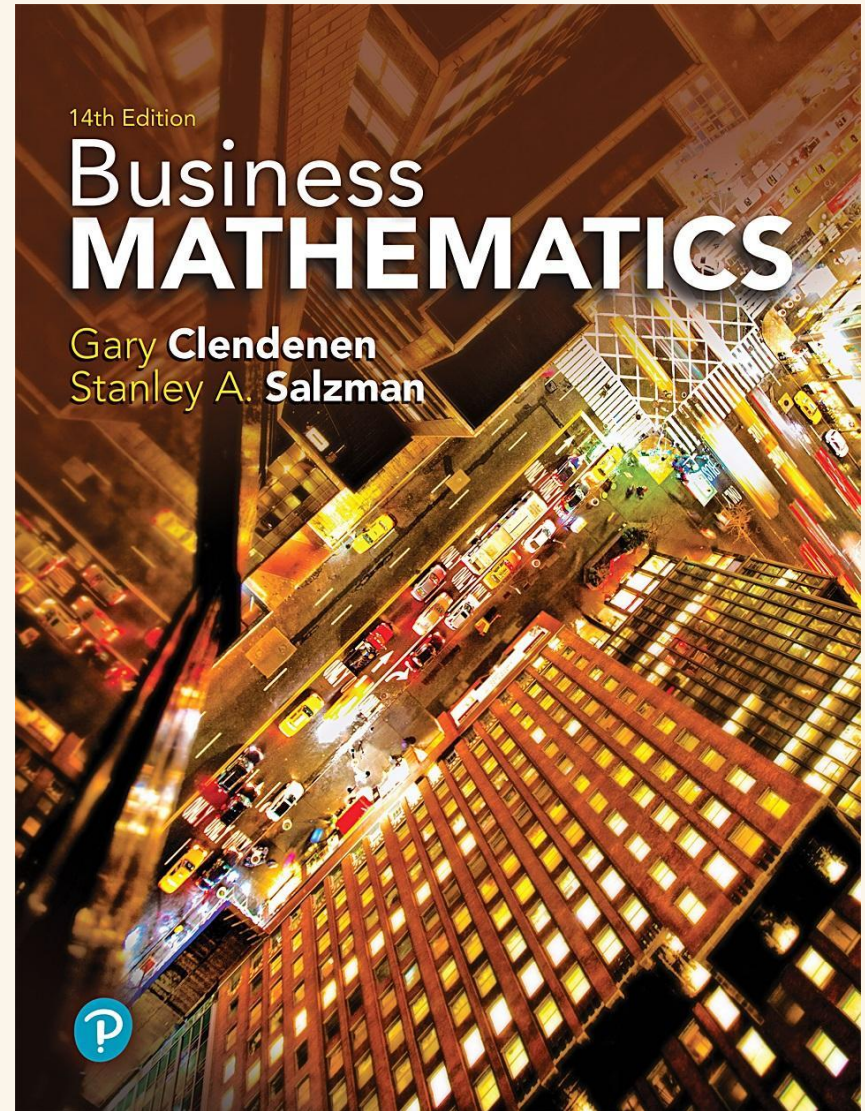


Chapter 8

Mathematics of Selling

Section 2

Markup on Selling Price



Objectives

1. Understand the phrase *markup based on selling price*.
2. Solve markup problems when selling price is the base.
3. Use the markup formula to solve variations of markup problems.
4. Determine the percent markup on cost and the equivalent percent markup on selling price.

Objectives

5. Convert markup percent on cost to markup percent on selling price.
6. Convert markup percent on selling price to markup percent on cost.
7. Find the selling price for perishables.

Understand the Phrase

Markup Based on Selling Price

Retailers often compare business operations to sales revenue and therefore often prefer to use **markup on selling price**.

In this case, markup is stated as a percent of selling price.

Finding

Markup Based on Selling Price

$$\text{Markup on selling price} = \frac{\text{Amount of markup}}{\text{Selling price}}$$

The same basic markup formula is used when using markup on selling price:

$$C + M = S.$$

Solve Markup Problems when Selling Price is the Base

Selling price is the base, or 100%

$$\begin{array}{r} ? \% \ C \ \$ \ ? \\ ? \% \ M \ \$ \\ \hline 100\% \ S \ \$ \quad \text{base} \end{array}$$

Example 1 (1 of 4)

During a sale, REI sells one model of kids sunglasses for \$39.99. They pay \$35 for each pair and calculate markup on selling price. Find the amount of markup, the percent of markup on selling price, and the percent of cost on selling price.

Example 1 (2 of 4)

Set up the problem. Selling price is base.

$$\begin{array}{rcl} ? \% & C & \$35.00 \\ ? \% & M & \$? \\ \hline 100\% & S & \$39.99 \end{array}$$

$$\begin{aligned} \text{Markup} &= \text{Selling price} - \text{Cost} \\ &= \$39.99 - \$35 = \$4.99 \end{aligned}$$

Example 1 (3 of 4)

Solve for either of the rates and subtract the result from 100% to find the other.

$$\begin{aligned}\text{Rate} &= \frac{\text{Markup}}{\text{Selling price}} \\ &= \frac{\$4.99}{\$39.99} = 12.5\%\end{aligned}$$

Cost as a percent of selling price can be found either by subtracting $100\% - 12.5\%$, or by dividing the cost of \$35 by the selling price of \$39.99.

Example 1 (4 of 4)

87.5% *C* \$35.00

12.5% *M* \$4.99

100% *S* \$39.99

Here, selling price is the base and is associated with 100%. The markup in this example is very low—REI will probably take a loss on these sunglasses, but managers hope the low price will bring customers into the store.

Average Markups for Retail Stores (Markup on Selling Price)

<u>Type of Store</u>	<u>Markup</u>
General merchandise stores	29.97%
Grocery stores	22.05%
Motor vehicle dealers (new)	12.83%
Gasoline service stations	14.47%
Other automotive dealers	29.57%
Apparel and accessories	37.64%

Average Markups for Retail Stores (Markup on Selling Price)

<u>Type of Store</u>	<u>Markup</u>
Furniture and home furnishings	35.75%
Bars	52.49%
Restaurants	56.35%
Drug and proprietary stores	30.81%
Liquor stores	20.19%
Sporting goods and bicycle shops	29.72%

Use the Markup Formula to Solve Variations of Markup Problems

The basic formula may be used for all markup problems in which selling price is the base.

The selling price has a percent value of 100%.

Example 2 (1 of 3)

A Walmart employee needs a 35% markup on selling price in order to have a markup of \$5.16 on a bottle of aspirin. How much can Walmart pay per bottle?

Example 2 (2 of 3)

Cost as a percent of selling price is found by subtracting 35% from 100% to find 65%.

$$\begin{array}{r} 65\% \ C \ \$ \ ? \\ 35\% \ M \ \$5.16 \\ \hline 100\% \ S \ \$ \ ? \end{array}$$

Find the selling price as follows.

Markup = 35% of selling price

$$\$5.16 = .35 \times S$$

Example 2 (3 of 3)

Divide both sides by .35 to find the selling price.

$$S = \$5.16 \div .35 = \$14.74$$

Finally, find the cost by subtracting.

$$C = S - M = \$14.74 - \$5.16 = \$9.58$$

The final table is shown here.

65%	<i>C</i>	\$9.58
35%	<i>M</i>	\$5.16
100%	<i>S</i>	\$14.74

Example 4 (1 of 3)

Find the markup on a dartboard made in England if the cost is \$27.45 and the markup is 25% of selling price.

Example 4 (2 of 3)

Subtract 25% from 100% to find that cost is 75% of selling price.

$$\begin{array}{rcl} 75\% & C & \$27.45 \\ 25\% & M & \$? \\ \hline 100\% & S & \$? \end{array}$$

Cost = 75% of selling price

$$\$27.45 = .75 \times S$$

$$S = \$27.45 \div .75 = \$36.60$$

Example 4 (3 of 3)

Finally:

$$\begin{aligned}\text{Selling price} - \text{Cost} &= \$36.60 - \$27.45 \\ &= \$9.15\end{aligned}$$

Here is the completed table.

65%	<i>C</i>	\$27.45
35%	<i>M</i>	\$ 9.15
100%	<i>S</i>	\$36.60

Determine the Percent Markup on Cost and the Equivalent Percent Markup on Selling Price

Salesperson who sells to both manufacturers and retailers will compare markup on cost with markup on selling price

May have to make conversions between the two methods

Example 5 (1 of 4)

A manufacturer makes and sells fishing lures. One lure has a cost of \$2.10 and is sold to distributors and wholesalers for \$3.20. Find the percent markup on cost and also the percent markup on selling price.

Example 5 (2 of 4)

Set up using cost as the base, or 100%.

$$100\% \quad C \quad \$2.10$$

$$\frac{\quad ? \% \quad M \quad \$ \quad ? \quad}{\quad}$$

$$? \% \quad S \quad \$3.20$$

$$\text{Markup} = S - C = \$3.20 - \$2.10 = \$1.10$$

Markup as a percent of cost

$$= \$1.10 \div \$2.10 = 52.4\%$$

Selling price as a percent of cost

$$= 100\% + 52.4\% = 152.4\%$$

Example 5 (3 of 4)

Set up using selling price as the base, or 100%.

$$\begin{array}{r} ? \% \ C \ \$2.10 \\ ? \% \ M \ \$1.10 \\ \hline 100\% \ S \ \$3.20 \end{array}$$

Cost as a percent of selling price

$$= \$2.10 \div \$3.20 = 65.6\%$$

Markup as a percent of selling price

$$= 100\% - 65.6\% = 34.4\%$$

Example 5 (4 of 4)

This example shows that a 52.4% markup on cost results in the same dollar markup as a 34.4% markup on selling price.

In other words, a 52.4% markup on cost is equivalent to a 34.4% markup on selling price.

Convert Markup Percent on Cost to Markup Percent on Selling Price

Another method for markup comparisons is to use the **conversion formulas**.

$$\frac{\% \text{ markup on cost}}{100\% + \% \text{ markup on cost}} = \% \text{ markup on selling price}$$

Example 6 (1 of 2)

Convert a markup of 25% on cost to its equivalent markup on selling price.

Use the formula for converting markup on cost to markup percent on selling price.

$$\frac{\% \text{ markup on cost}}{100\% + \% \text{ markup on cost}} = \% \text{ markup on selling price}$$

Example 6 (2 of 2)

$$\frac{25\%}{100\% + 25\%} = \frac{25\%}{125\%} = \frac{.25}{1.25} = .20 = 20\%$$

A markup of 25% on cost is equivalent to a markup of 20% on selling price.

Convert Markup Percent on Selling Price to Markup Percent on Cost

Another method for markup comparisons is to use the **conversion formulas**.

$$\frac{\% \text{ markup on selling price}}{100\% - \% \text{ markup on selling price}} = \% \text{ markup on cost}$$

Example 7 (1 of 2)

Convert a markup of 20% on selling price to its equivalent markup on cost.

Use the formula for converting markup on selling price to markup on cost.

$$\frac{\% \text{ markup on selling price}}{100\% - \% \text{ markup on selling price}} = \% \text{ markup on cost}$$

Example 7 (2 of 2)

$$\frac{20\%}{100\% - 20\%} = \frac{20\%}{80\%} = \frac{.20}{.80} = .25 = 25\%$$

A markup of 20% on selling price is equivalent to a markup of 25% on cost.

Markup Equivalents

Markup on Cost Markup on Selling Price

20% 16 2/3%

25% 20%

50% 33 1/3%

75% 42 6/7%

100% 50%

Find the Selling Price for Perishables

Some items will spoil, cannot be sold, and must be considered when determining the selling price

Example 8 (1 of 4)

New York Bagels bakes 60 dozen bagels at a cost of \$6.48 per dozen. Generally an average of 5% of the bagels remain unsold at the end of the day and are donated to a homeless shelter. If a markup of 50% on selling price is needed, find the selling price per dozen.

Example 8 (2 of 4)

Find the total costs of the bagels.

$$\text{Cost} = 60 \text{ dozen} \times \$6.48 = \$388.80$$

Find the selling price, markup is 50%.

$$50\% \quad C \quad \$388.80$$

$$50\% \quad M \quad \$?$$

$$100\% \quad S \quad \$?$$

$$\text{Base} = \frac{\text{Part}}{\text{Rate}} = \frac{\$388.80}{.5} = \$777.60$$

Example 8 (3 of 4)

The total selling price is \$777.60.

Find the number of dozen bagels that will be sold. Since 5% will not be sold, 95% will be sold.

$$95\% \times 60 \text{ dozen} = 57 \text{ dozen bagels sold}$$

The selling price of \$777.60 must be received from the sale of **57** dozen bagels.

Example 8 (4 of 4)

Find the selling price per dozen bagels by dividing the total selling price by the number of bagels sold.

$$\frac{\$777.60}{57} = \$13.64 \text{ selling price per dozen}$$

A selling price of \$13.64 per dozen gives the desired markup of 50% on selling price while allowing for 5% of the bagels to be unsold.