Example Finding the Cost of an Item

The selling price of a pair of ski boots is $98. The markup rate is 60%. What is the cost of the boots?

Solution

Verbal Model:

$$\boxed{\text{Selling price}} = \boxed{\text{Cost}} + \boxed{\text{Markup}}$$

Labels:

Selling price $= 98$	(dollars)
Cost $= x$	(dollars)
Markup rate $= 0.60$	(rate in decimal form)
Markup $= 0.60x$	(dollars)

Equation:

$98 = x + 0.60x$	Original equation
$98 = 1.60x$	Combine like terms.
$61.25 = x$	Divide each side by 1.60.

The cost is $61.25. Check this in the original statement of the problem.

Example Finding the Markup Rate

A pair of walking shoes sells for $60. The cost of the walking shoes is $24. What is the markup rate?

Solution

Verbal Model:

$$\boxed{\text{Selling price}} = \boxed{\text{Cost}} + \boxed{\text{Markup}}$$

Labels:

Selling price $= 60$	(dollars)
Cost $= 24$	(dollars)
Markup rate $= p$	(rate in decimal form)
Markup $= p(24)$	(dollars)

Equation:

$60 = 24 + p(24)$	Original equation
$36 = 24p$	Subtract 24 from each side.
$1.5 = p$	Divide each side by 24.

Because $p = 1.5$, it follows that the markup rate is 150%.

Example   Finding the Selling Price

A sporting goods store uses a markup rate of 55% on all items. The cost of a golf bag is $45. What is the selling price of the bag?

Solution

Verbal Model: $\boxed{\text{Selling price}} = \boxed{\text{Cost}} + \boxed{\text{Markup}}$

Labels:

Selling price $= x$	(dollars)
Cost $= 45$	(dollars)
Markup rate $= 0.55$	(rate in decimal form)
Markup $= (0.55)(45)$	(dollars)

Equation:

$$x = 45 + (0.55)(45) \qquad \text{Original equation.}$$
$$= 45 + 24.75 \qquad \text{Multiply.}$$
$$= \$69.75 \qquad \text{Simplify.}$$

The selling price is $69.75. You can check your solution as follows:

$$x = 45 + (0.55)(45) \qquad \text{Write original equation.}$$
$$69.75 \overset{?}{=} 45 + (0.55)(45) \qquad \text{Substitute 69.75 for } x.$$
$$69.75 = 69.75 \qquad \text{Solution checks. } ✓$$

Three Exercises *(Answers in red)*

The suggested retail price of a digital camcorder is $1150. The camcorder is on sale for "20% off" the list price. Find the sale price. $920

The selling price of a box of cereal is $4.68. The markup rate for the grocery store is 40%. What is the cost of the cereal? $3.34

A coat sells for $250 during a 20% off storewide clearance sale. What was the original price of the coat? $312.50

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Example   Finding the Discount Rate

During a midsummer sale, a lawn mower listed at $199.95 is on sale for $139.95. What is the discount rate?

Solution

Verbal Model:

$$\boxed{\text{Discount}} = \boxed{\begin{array}{c}\text{Discount} \\ \text{rate}\end{array}} \cdot \boxed{\begin{array}{c}\text{List} \\ \text{price}\end{array}}$$

Labels:

Discount $= 199.95 - 139.95 = 60$	(dollars)
List price $= 199.95$	(dollars)
Discount rate $= p$	(rate in decimal form)

Equation:

$60 = p(199.95)$ Original equation

$0.30 \approx p$ Divide each side by 199.95.

Because $p \approx 0.30$, it follows that the discount rate is approximately 30%.

Example   Finding the Sale Price

A drug store advertises 40% off the prices of all summer tanning products. A bottle of suntan oil lists for $3.49. What is the sale price?

Solution

Verbal Model:

$$\boxed{\begin{array}{c}\text{Sale} \\ \text{price}\end{array}} = \boxed{\begin{array}{c}\text{List} \\ \text{price}\end{array}} - \boxed{\text{Discount}}$$

Labels:

List price $= 3.49$	(dollars)
Discount rate $= 0.4$	(rate in decimal form)
Discount $= 0.4(3.49)$	(dollars)
Sale price $= x$	(dollars)

Equation: $x = 3.49 - (0.4)(3.49) \approx \$2.09$

The sale price is $2.09. Check this in the original statement of the problem.

Four Exercises *(Answers in red)*

Selling Price An electronics store uses a markup rate of 62% on all items. The cost of a CD player is $48. What is the selling price of the CD player?
$77.76

Sale Price A clothing store advertises 30% off the list price of all sweaters. A turtleneck sweater has a list price of $120. What is the sale price? $84

Sales The sales (in millions) for the Yankee Candle Company in the years 2000 and 2001 were $338.8 and $379.8, respectively. Determine the percent increase in sales from 2000 to 2001. 12.1%

Price Increase The manufacturer's suggested retail price for a car is $18,459. Estimate the price of a comparably equipped car for the next model year if the price will increase by $4\frac{1}{2}\%$. $19,290