Section 2.3

Part 1 - Solving Equations

With an equation as long as you perform the same operation to both sides there is never a problem. The basic plan is to get all of the variable items on one side and all of the number items on the other.

Example #4, page 62

\[ 0.07y = 0.42 \]

Notice the variable is on one side and the number is on the other. There is also nothing that is being added or subtracted. Therefore we need to clear the 0.07 by dividing.

\[ \frac{0.07y}{0.07} = \frac{0.42}{0.07} = 6 \]

Example #18, page 62

\[ 0.3(2n - 5) = 11 - 0.65n \]

In this problem I notice that the variable "n" is on both sides and there is a set of ( ) on the left. Order of operations suggests that we distribute first.

\[ 0.6n - 1.5 = 11 - 0.65n \]
\[ 0.6n + 0.65n = 11 + 1.5 \]

Combine like terms.

\[ 1.25n = 12.5 \]
\[ \frac{1.25n}{1.25} = \frac{12.5}{1.25} \]
\[ n = 10 \]

Part 2 - Business Word Problems

The hardest part is transforming the words into a mathematical equation.

Example #30, page 62

Jim bought a pair of jeans at a 25% discount sale for $45. What was the original price?

ANS.

In this problem we do not need to worry about tax. There was an original price call it P. You can look at this problem two ways.
Way 1 -> 100% of original - 25% off original = $45

\[ P - 0.25P = 45 \]
\[ 0.75P = 45 \]
\[ P = \frac{45}{0.75} = $60 \]

Way 2 -> Since it was 25% off you only paid 75% of the original

\[ 0.75P = 45 \]
\[ P = \frac{45}{0.75} = $60 \]

**Example #34, page 63**

The owner of a pizza store wants to make a profit of 70% of the cost of every pizza sold. It costs $7.50 to make a pizza, at what price should each pizza be sold.

ANS.

Logic tells us that the price must be at least $7.50 to cover the cost. So we need 100% of original + 70% profit so

\[ \text{Price} = 7.50 + 0.70(7.50) \]
\[ = $12.75 \]

**Example #40, page 63**

A textbook costs a bookstore $45, and the store sells it for $60. Find the rate of the profit based on the selling price.

Ans.

Clearly the book has been marked up by 60 - 45 = $15

Now the important part is 15 is what % of the SELLING price?

\[ 15 = x \cdot 60 \]
\[ \frac{15}{60} = x = 0.25 \]

So we conclude 25% profit relative to the selling price.

If the problem had said what is the profit based on the COST then we would solve.
$15 = x \cdot 45$

$\frac{15}{45} = x = 0.3333$

and we would have concluded 33.33% profit relative to the cost.