

Lesson 7: Percents

SPECIFIC OBJECTIVES

Calculate Percentages

By the end of this lesson you will understand that...

- Markup and Margin are different ways to calculate profit
- Discount is a subtraction problem
- Percent problems can often be solved in either one or two steps

By the end of this lesson you will be able to...

- Correctly interpret words in a problem statement and use the necessary operations to find the result
- Use the construction calculator to compute the answer to percent problems and interpret the results
- Check the reasonableness of computed answers to percent word problem.

Problem Situation #1: Purchasing Materials for a floor

Students need to have Lesson 1 handy as it is referred to in this first problem situation

At the beginning of the semester you got a job as the general contractor to build a brand new house. Go through your materials and find your in class notes for Lesson 1. We are going to revisit parts of that lesson today.

Now that you have some experience under your belt, we are going to go back to Problem Situation #1 in Lesson 1 and come up with a more accurate calculation for the material costs for the Sill plate.

1. Take a minute to review Problem Situation 1 from Lesson 1. Write down the work you did in question #4 from that lesson below:

From Lesson 1 #4: You can purchase the plate material in 12' lengths, but you cannot use any scraps shorter than 6 feet. Based on these limitations, how many pieces of 12' sill plate material will you need? Be sure to show or explain how you determined your answer.

Definition:

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2. Redo your calculation for the number of pieces of 12' sill plate material you will need using a waste factor of 10%.

3. Questions 5 and 7 from Lesson 1 asked you to calculate how much the materials cost for the sill plate material and the subfloor (what would you pay at the check-out?). Write your answers down below from those two questions and then calculate the total cost, this time, include Wisconsin state tax of 5.5%.

Question #5 (Sill Plate Material Cost) _____

Question #7 (Subfloor Material Cost) _____

Total cost (including tax) _____

Problem Situation #2: Calculating Labor Costs

In your estimating class you will be using the book 'Craftsman Labor Cost Estimator' quite a bit. This problem situation is designed to give you a taste of the work you will be doing in that class. Your instructor will hand out two pages out of the book to get you started.

4. Review the handout for the 'Craftsman Labor Cost Estimator' pages 10 and 11 and find the row for Carpenter.
 - a. What is the Carpenter's 'Base Wage per Hour?'

 - b. Using the numbers for the Carpenter, show the math that was done to get the number (\$8.56) in Column 4.

 - c. Show the calculations below to get from the Carpenter's 'Base Wage per Hour' to the 'Total Hourly Cost.'

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5. What if, instead of the Base wage per hour being \$25.72, it is \$34. Use the column calculations as a guide to determine the new Total hourly cost. To help you, the table from the handout is re-created below. Show your work in the space below and fill in values for columns 1, 2, 4, 5 & 6.

Craft	Base wage per hour	Taxable fringe benefits	Insurance & employer taxes (%)	Insurance & employer taxes (\$)	Non-taxable fringe benefits	Total hourly cost
Carpenter			31.56			

Problem Situation #3: Lumberyard Purchases

As you know, figuring out how much lumber you need to buy is just the first step in determining how much to charge a customer for your work. You also need to price out the materials.

6. One situation that happens often is that a lumberyard will list the retail price for some lumber. But, they have a different price for contractors. Rather than showing both prices, they just tell you that, as a contractor, you get an 8% discount.
- Return to question 3 in problem situation 1. How much will you spend on the sill and sub floor material with your contractor discount?

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7. You are shopping around for the best deal to purchase treated lumber for a deck. You went to the lumber store and the price for 8' long pressure-treated decking boards that are 6 inches wide costs \$6.16 per board. You are sure that you spent less per board when you built a deck on your brother's house last summer. You didn't keep the receipt for that purchase, but, from your credit card receipt, you know you spent \$150.12
- If you purchased 27 boards when you built your brother's deck, how much did you spend per board (assume you didn't get a contractor discount).

 - Did you spend less per board on your brother's deck? How much less?

Problem Situation #4: Profit – markup versus margin

In the world of making money, this is an important formula:

$$\text{Contractor Cost} + \text{Contractor Profit} = \text{Charge to Customer}$$

We've spent a lot of time this semester calculating costs. Now it is time to talk about profit. In general, people decide to add a percentage onto their costs to decide how much to charge their customer.

You are bidding for a job to build a garden shed. The total cost for the job is \$1700. You need to decide how much money you are going to charge your customer, so you need to calculate how much profit you want to earn for the job.

There are two common ways to calculate Profit. Using Markup or Margin. Since both methods use a Percent, we are going to compare them by selecting a % and using it in both calculations.

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Definitions:

- **Markup:**

- **Margin:**

8. Choose your % that you will use to calculate Markup or Margin and write it here _____ %
9. Based only on the definitions, PREDICT: will your profit for the job be the same or different with the two methods? If different, which one will be more? State your prediction and explain why you think that.

Commented [CP1]: I am a little confused here. How can we calculate the margin profit if we don't know the amount charged to the customer. I will have to ask you about this one face-to-face.

Method 1: Markup

10. Using the definition for markup, and the percent you selected in question 8, calculate (use your calculator, and show your calculations in the space below):
 - a. What is the amount you charge your customer?

 - b. What is your Profit?

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Method 2: Margin

11. Using the definition for margin, and the percent you selected in question 8, calculate (use your calculator, and show your calculations in the space below):

a. What is the amount you Charge your Customer?

b. What is your Profit?

12. Was your prediction in 9 correct? Discuss with your group and show or explain why.

Markup Formulas:

Margin Formulas:

13. Assume a percentage for your profit of 20%. If the cost for your job is \$800, calculate

a. Charge to the Customer using Markup

b. Charge to the Customer using Margin

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Making Connections

Mini-Lesson

Markup: calculating the profit by taking a % OF your costs.	
<p>Example (2 steps):</p> <ul style="list-style-type: none">• Cost = \$100• Choose your Markup % _____• Calculate the Markup (profit) _____ • Calculate the Customer Charge _____	<p>Example (1 step):</p> <ul style="list-style-type: none">• Cost = \$100• Choose your Markup % _____• Calculate the total <i>Percent</i> (100% Cost + % Markup) _____ • Calculate the Customer Charge _____• Calculate the Profit _____

Margin: calculating the profit by taking a % OF the Customer Charge.
<p>Example:</p> <ul style="list-style-type: none">• Cost = \$100• Choose your Margin % _____• Calculate the <i>Percent</i> of the Customer Charge that is the cost (100% Cost - % Margin) _____ • Calculate the Profit _____• Calculate the Customer Charge _____

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Practice/Homework

Pg 59 #1, #3, #5

Pg 60, #13, #14, #15

Pg 61 #25

For #25, calculate the amount you charge the customer if you desire a 12% margin.

Pg 61, #29