Worksheet #3

Landscapers and Horticulturists are often required to solve problems involving time and money as they relate to billing a customer and with regards to their pay. Many workers are paid by the hour, but others work under a flat-rate system. A flat rate system uses time studies to determine how long it should take to do a job on average. If the worker takes longer than this average time, they still are paid the flat rate. If they finish the job in less time they still get the same flat rate. Flat-rate times are often given in hours and tenths of hours. Since there are 60 minutes in 1 hour, $\frac{1}{10}$th of an hour is

$$60 \frac{\text{minutes}}{\cancel{\text{hour}}} \times \frac{1}{10} \cancel{\text{hour}} = 6 \text{ minutes.}$$

Writing the equation this way makes it easy to convert from one unit of time to another. When one unit (like an "hour") is divided by the same unit, they cancel (that's what the slashes on top of the "hours" show). In this example, the "hour" in each term cancel out leaving only the minute units and the numbers. When converting from one time to another, try to set up an equation so that the units you want to convert cancel out, leaving only the units you want.

Example: How many hours are there in $3\frac{1}{2}$ days?

You should know that there are 24 hours in one day. First convert the mixed number into an improper fraction (this will make multiplying easier). $3\frac{1}{2} = \frac{7}{2}$. Then multiply by the conversion factor so that the units you don't want cancel:

$$\frac{7}{2} \cancel{\text{days}} \times 24 \frac{\text{hours}}{\cancel{\text{day}}} = \frac{168}{2} \text{ hours} = 84 \text{ hours}.$$

Example: How many seconds are there in 43.5 minutes? Hint: There are 60 seconds in one minute. That can be written as a conversion fraction: 60 seconds *per* minute is the same thing as $\frac{60 \text{ seconds}}{1 \text{ minute}}$. So,

$$43.5 \cancel{\text{minutes}} \times \frac{60 \text{ seconds}}{1 \cancel{\text{minute}}} = 2610 \text{ seconds}.$$

Example: The flat-rate time to do maintain the grounds at a particular motel chain is $2\frac{3}{10}$ hours and the pay is $80 for that work. A worker does 3 motel jobs in one 8-hour day. How much does he get paid for his efforts?

Since they are using a flat-rate pay system, the worker should get paid $80 for each job completed, for a total of 3 x $80 = $240.

What was the hourly pay for the worker for that days work?

The worker made \$240 in 8 hours. So his hourly pay is $\frac{\$240}{8 \text{ hours}} = \frac{\$30}{\text{hour}}$.

The most frequently used equation by anyone who purchases or computes the cost of any purchase (plants, clothes, books, etc.) is this one: The total cost of an item equals the number purchased times the cost per unit.

Total cost = (amount purchased)x(cost per unit)

Example: You purchase 4 flats of annuals at \$12.95 per flat. Each flat contains 24 plants. What is the total cost? (Before taxes). Also find how much it costs per plant.

The total cost = (4 flats) $\text{x}\frac{\$12.95}{1 \text{ flat}} = \$51.80$

Since there are 24 plants in a flat, $\frac{\$12.95}{1 \text{ flat}} = \frac{\$12.95}{24 \text{ plants}} = \$.5396$ per plant. This number should be rounded up to the nearest cent: \$.5396 = 53.96 cents = 54 cents = \$.54 per plant. (Note that to convert from dollars to cents you multiply the dollars by 100.Divide by 100 if you want to convert from cents to dollars.)

Homework Problems

1. A worker works on the planting of a large garden. He starts at 8:25 AM and finishes at 3:23 PM, and takes one hour off for lunch. At \$12.75 per hour, find out how much the worker earned to the nearest cent, assuming the lunch hour was unpaid.

2. The grounds of a large office building are completely replanted and resodded, taking 132 hours total to finish the job. Using an 8-hour workday, how many days and hours did it take to do the job?

3. A laborer works for a landscaping company that uses a flat rate pay system. The flat-rate time for laying 1000 square feet of sod is 6/10 hours and the flat rate pay is \$9. He takes 4/10 hours to lay the first 1000 sq.ft of sod, but 8/10 hours to lay the second 1000 sq. ft (it got hot!) He then takes 5/10 hours to lay the sod for the third 1000 sq.ft. plot. How much did he earn for his efforts? What was his hourly wage? If he had worked at exactly the flat rate time for these three jobs, what would his hourly wage have been?

4. Looking at your timecards for the week, you see that you worked 8 hours 23 minutes on Monday, 7 hours and 14 minutes on Tuesday, 8 hours and 5 minutes on Wednesday, 9 hours and 31 minutes on Thursday, and 6 hours and 14 minutes on Friday. You are paid \$12.50 per hour. How much is your pay for the week (before taxes)?

5. A landscaper buys 13 tons of gravel at $20.50 per ton. If the gravel is sold at $35 per ton to a customer, what is the landscaper's profit after all the gravel is sold?

6. What is the total cost of these items: 2 commercial fertilizer and seed spreaders, $109.27 each; 20 pallets of Zoysia sod plugs at $11.95 per pallet, 5 pounds of Zoysia grass seeds at $95, and three 10 pound bags of lawn starter fertilizer at $5.95 each?

7. A worker's paycheck for a 5-day workweek is $465.80. A workday is 8 hours. What is the worker's hourly pay?

8. A landscaper buys a 200-foot roll of 4-inch tall plastic lawn edging for $41.00. If 65 ½ feet of edging is required for a garden, how much does it cost to put edging around this garden? How much edging remains on the roll?

9. A car gets 20 miles per gallon and has a full gas tank with 16.5 gallons of gas when it leaves on a trip. If gas costs $2.85 per gallon, how much does it cost per mile to drive until the tank is empty? Hint: First find the total cost of a tank of gas and the total number of miles traveled on the trip.

10. A spray can of mosquito repellent costs $3.89. If one can lasts for 5 working days for 6 employees, how much does it cost per month for mosquito repellent? If 10 more employees are added to the crew, how many cans should be bought per week to ensure there is just enough repellent?