

End of Module 4 Study Guide

SHOW ALL WORK

Part I - Calculator ALLOWED

1. Bobby James works at a car dealership and earns commission on his total sales for the month. His monthly paycheck was in the amount of \$7,000, including his salary of \$2,500. His sales for the month totaled \$145,000. Express his rate of commission as a percent. Round to the nearest whole number.

$$7000 - 2500 = 4500 \text{ in commission}$$

$$\% = \text{Part} / \text{Whole}$$

$$\% = 4500 / 145000 = 0.031 \approx 3\%$$

His rate of Commission is 3%.

2. Ravi and his four friends went out to lunch in Danville and they wanted to leave a 15% tip on a bill that totaled \$59.49 before tax and tip. The tip is on the cost of the food plus tax. The sales tax rate in Danville is 5%.
- a. Use mental math to estimate the approximate total cost of the bill including tax and tip to the nearest dollar. **Explain how you arrived at your answer.**

The bill is approximately \$60 before tax.
 10% of \$60 is \$6, so a 5% sales tax would = \$3
 Therefore they would need to tip on a \$63 bill.
 10% of \$63 is \$6.30 and another 5% would result in a total tip of \$9.45. Thus, the total (meal, tax and tip) is approximately \$73.

- b. Find the actual total of the bill including tax and tip. If Ravi and his four friends split the bill equally, how much will each person pay including tax and tip?

$$\text{Amt of sales tax} = \% (\text{Whole}) = (0.05)(59.49) = \$2.97$$

$$\text{New Whole} = 59.49 + 2.97 = \$62.46$$

$$\text{Amt of tip} = \% (\text{Whole}) = (0.15)(62.46) = \$9.37$$

$$\text{Total bill} = 9.37 + 62.46 = \boxed{\$71.83}$$

$$\text{OR } (1.05)(59.49)(1.15) = \$71.83$$

$$\text{Each person would pay } 71.83 / 5 = \boxed{\$14.37 / \text{person}}$$

Name: _____ Date: _____

3. Tamera, Cassie and Julie wrote equations to calculate the amount of money in a savings account after one year with $\frac{3}{4}\%$ interest paid annually on a balance of M dollars. Let T represent the total amount of money saved.

Tamera's Equation: $T = 1.075M$

Cassie's Equation: $T = M + 0.0075M$

Julie's Equation: $T = M(1 + 0.0075)$

↑
principal

Total, $T = \text{principal} + \text{interest}$

- a. The three students decided to see if their equations would give the same answer by using a \$100 balance. Find the total amount of money in the savings account using each student's equation. SHOW YOUR WORK.

Tamera: $T = 1.075(100) = \$107.50$

Cassie: $T = 100 + 0.0075(100) = \100.75

Julie: $T = 100(1.0075) = \$100.75$

- b. Explain why their equations will or will not give the same answer.

Tamera did not convert $\frac{3}{4}\%$ to a decimal correctly → she is missing a zero (should be 0.0075).

Cassie & Julie both used the distributive property to solve their equations and the correct decimal of 0.0075.

4. A printing company is enlarging the image on a postcard to make a calendar. The enlargement of the postcard's image is done using a scale factor of 160%. Be sure to show all other related math work used to answer the following questions.

a. Represent a scale factor of 160% as a fraction and a decimal.

$$160\% = \boxed{1.60} = \frac{160}{100} = \boxed{\frac{8}{5}}$$

b. The postcard's dimensions are 4 inches by 6 inches. What are the dimensions of the calendar?

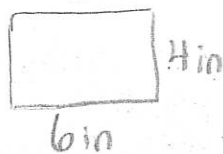
Scale factor = $\frac{\text{New}}{\text{original}}$

$(SF)(\text{original}) = \text{new}$

$(1.6)(6) = 9.6 \text{ in}$

$(1.6)(4) = 6.4 \text{ in}$

$\boxed{6.4 \text{ in by } 9.6 \text{ in}}$

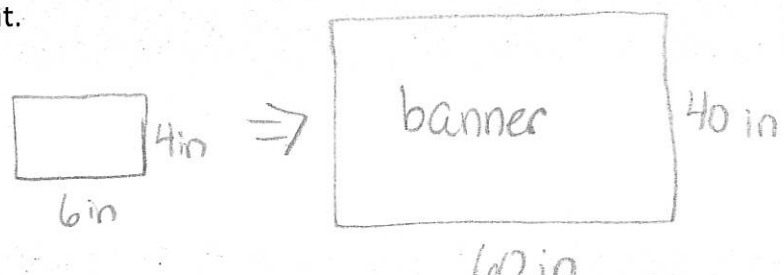


c. If the printing company wants to make a banner by enlarging the postcard image, and the banner's dimensions are 40 inches by 60 inches, represent the scale factor as a percent.

$SF = \frac{\text{new}}{\text{original}} = \frac{60}{6} = 10 = 1000\%$

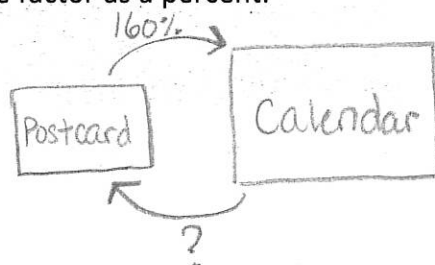
$\frac{40}{4} = 10 = 1000\%$

$\boxed{\text{The scale factor is } 1000\%}$



d. Suppose the printing company wanted to start with the calendar's image and reduce it to make the postcard's image. What scale factor would you use? Represent the scale factor as a percent.

$\frac{1}{160\%} = \frac{1}{1.60} = 0.625 = \boxed{62.5\%}$



Part II – NO CALCULATOR

5. A \$200 tablet is marked up by 20% and then marked down by 20%. What is the final price? Explain your answer.

20% markup {

$$\begin{aligned} \text{Selling Price} &= (1+m)(\text{Whole}) \\ &= (1+0.2)(200) \\ &= (1.2)(200) \\ &= \$240 \end{aligned}$$

200	³ 240
x 1.2	x 0.8
<hr/> 400	<hr/> 1920
+ 2000	0000
<hr/> 240.0	<hr/> 192.0

Then, a 20% markdown means $(1-0.2)(240) = \boxed{\$192}$

6. A 10-gallon mixture contains 30% red food coloring. A 4-gallon mixture contains 60% red food coloring. What percent red food coloring is obtained by putting the two mixtures together? Show your work.

Part + Part = Whole

$$(0.3)(10) + (0.6)(4) = (x)(14)$$

$$3 + 2.4 = 14x$$

$$\frac{5.4}{14} = \frac{14x}{14}$$

$$0.386 = x$$

$\boxed{38.6\% \text{ red food coloring}}$