

Math Encounters Final Review Part 1

Name: _____

Chapter 1: Simplifying expressions and solving equations showing all work.

- Use PEMDAS – don't forget the left to right rule for M & D
- Simplifying expressions means you're just putting the terms in their simplest form, you're not solving for the variable
- To simplify, use the distributive property and combine like terms (variables with the same letter and exponent)
- Fractions – multiply across the numerators and denominators (tops and bottoms)
- Cross multiply only when there's an equal sign between two fractions
- You only need common denominators if you're adding or subtracting fractions

1. $10 - 24 \div 6 \cdot 3 + 1$
 $10 - 4 \cdot 3 + 1$
 $10 - 12 + 1$
 $-2 + 1 = \boxed{-1}$

2. $-5 - 8(-3) - (-2)^4$
 $-5 + 24 - 16$
 $19 - 16 = \boxed{3}$

3. $3(3d - 4) - 7(5d - 4)$
 $9d - 12 - 35d + 28$
 $\boxed{-26d + 16}$

$\frac{35}{26} \frac{28}{16}$

4. $(6y^2) + 9y + 3(-3y^2) + (-5) + 1y^2$
 $\boxed{4y^2 + 9y + 8}$

5. $\frac{5}{4} \left(\frac{4}{5} k \right) = \left(\frac{10}{1} \right) \frac{5}{4}$
 $k = \frac{50}{4}$
 $\boxed{k = \frac{25}{2} = 12.5}$

6. $4n - 10 = 18 - 4n$
 $+4n + 10 \quad +10 + 4n$
 $\frac{8n}{8} = \frac{28}{8}$
 $\boxed{n = \frac{7}{2} = 3.5}$

7. $-2(3d - 12) = 15 - 5d$
 $-6d + 24 = 15 - 5d$
 $+6d - 15 \quad -15 + 6d$
 $9 = d$
 $\boxed{d = 9}$

8. $\frac{3x}{4} = \frac{2x+3}{3}$
 $4(2x+3) = 3x(3)$
 $8x + 12 = 9x$
 $-8x \quad -8x$
 $12 = x$
 $\boxed{x = 12}$

9. Solve the equation for y: a) $2y + 3x = 15$
 $\frac{2y}{2} = \frac{-3x + 15}{2}$
 $\boxed{y = -\frac{3}{2}x + \frac{15}{2}}$
 OR $y = \frac{-3x + 15}{2}$
 OR $y = -1.5x + 7.5$

b) $-3y - 4x = 12$
 $\frac{-3y}{-3} = \frac{4x + 12}{-3}$
 $\boxed{y = -\frac{4}{3}x - 4}$

"IS" MEANS = "OF" MEANS TIMES

Show the set up and work needed to answer all of the following questions.

10. a) 63 is 28% of what number?

$$63 = 0.28(x)$$

$$\frac{63}{0.28} = \frac{0.28x}{0.28}$$

$$x = \boxed{225}$$

b) 69 is what percent of 125?

$$69 = \frac{x}{100}(125)$$

$$\left(\frac{100}{125}\right)\left(\frac{69}{1}\right) = \frac{125x}{100} \left(\frac{100}{125}\right)$$

$$\frac{6900}{125} = x$$

$$x = 55.2$$

$\boxed{55.2\%}$

Final Review: CH 5 — Financial Math

Show the set up and answer for each question. Round all money answers to the nearest hundredths.

1. Jim bought a computer at Appliance City for \$850.50. His town has a 7.5% sales tax. Find the cash price of the computer including tax.

$$\text{TAX} = 0.075(850.50) = 63.79$$

OR

$$1.075(850.50)$$

$$\begin{array}{r} + 850.50 \\ \hline \underline{\$ 914.29} \end{array}$$

3. A new car originally cost \$15,000. Find the percent of decrease if it is later worth \$14,250.

$$\frac{\text{NEW} - \text{ORIGINAL}}{\text{ORIGINAL}} = \frac{14,250 - 15,000}{15,000} = -0.05$$

5% DECREASE

2. A \$1230 TV is marked down by 20%. Find its new sales price.

$$\begin{array}{l} 20\% \text{ MARKDOWN} = 0.20(1230) = 246 \\ 1230 - 246 = \underline{\underline{\$ 984}} \end{array}$$

OR

$$(1 - 0.2)(1230) = 984$$

4. A \$400 necklace is marked down by 15%. Find the new price.

$$\begin{array}{l} 15\% \text{ MARKDOWN} = 0.15(400) = 60 \\ 400 - 60 = \underline{\underline{\$ 340}} \end{array}$$

OR

$$(1 - 0.15)(400) = 340$$

5. A real estate agency takes a 5.8% commission on the sale of each house made by their agents. The realtors themselves then get a 65% commission off of the agency's commission. What is the realtor's commission earned on a house that sold for \$175,000?

$$0.058(175,000) = 10,150 \text{ COMMISSION TO AGENCY}$$

$$0.65(10,150) = \underline{\underline{\$ 6,597.50}} \text{ REALTOR'S COMMISSION}$$

6. Tina sells phone systems to small businesses. Her weekly salary includes a base pay of \$600 and a 15% commission on all sales over \$1,000.

a. How much would her salary be if she sells \$2200 worth of equipment in one week?

$$\text{AMOUNT OF SALES OVER 1,000: } 2200 - 1000 = 1,200$$

$$600 + 0.15(1200) = \underline{\underline{\$ 780}}$$

(BASE) + (COMMISSION)

b. How much would her salary be if she sells \$3500 worth of equipment in one week?

$$\text{SALES OVER 1,000: } 3500 - 1000 = 2,500$$

$$600 + 0.15(2,500) = \underline{\underline{\$ 975}}$$

7. \$200 is invested in an account paying 3.5% **simple interest** for eight years.
 a. How much interest is earned? $I = Prt$ b. What is the maturity value of the account? $M = P + I$

$$I = 200(0.035)8$$

$$I = \underline{\underline{\$56}}$$

$$M = 200 + 56$$

$$M = \underline{\underline{\$256}}$$

8. Find the final balance at the end of ten years on a deposit of \$25,000 in an account paying 1.25% interest if it is compounded:

a. quarterly
 $n = 4$

$$M = 25000 \left(1 + \frac{0.0125}{4}\right)^{4(10)}$$

$$= 25000(1.003125)^{40}$$

$$= \underline{\underline{\$28,323.19}}$$

b. weekly
 $n = 52$

$$M = 25000 \left(1 + \frac{0.0125}{52}\right)^{52(10)}$$

$$M = \underline{\underline{\$28,328.29}}$$

c. continuously $A = Pe^{rt}$

$$A = 25000 e^{(0.0125)(10)}$$

$$= 25000 e^{0.125}$$

$$= \underline{\underline{\$28,328.71}}$$

$$e = 2.718$$

* DON'T ROUND TOO EARLY ON THESE.
 LET YOUR CALCULATOR KEEP ALL DECIMALS UNTIL THE END.

9. You buy 100 shares of XYZ stock at \$23/share. If you sell the stock at \$32/share, what is the total amount of your gain or loss in dollars? What is your percent gain or loss?

$$\text{BUY: } 100(23) = \$2,300$$

$$\text{SELL: } 100(32) = \$3,200$$

$$\begin{array}{r} 3200 \\ - 2300 \\ \hline 900 \end{array}$$

$\underline{\underline{\$900 \text{ GAIN}}}$

$$\frac{\text{NEW-ORIGINAL}}{\text{ORIGINAL}} \cdot 100$$

$$\frac{3200 - 2300}{2300} \cdot 100 =$$

$\underline{\underline{39.13\% \text{ GAIN}}}$

10. One proposal in Congress has been to change the tax laws and have a "flat tax rate". This would require all citizens to pay the same percent of their gross pay to the federal government. If Joe's gross income this year is \$32,580 and the flat tax rate is 16%, how much income tax would Joe owe the government?

$$0.16(32,580) = \underline{\underline{\$5,212.80}}$$

11. You are married and made \$125,000 (gross income) last year. Your allowable deductions totaled \$35,000. Use table 5-11 to determine *how much cheaper* it would be to file jointly versus separately? Show your work.

$$\text{TAXABLE INCOME} = \text{GROSS INCOME} - \text{DEDUCTIONS}$$

$$= 125,000 - 35,000$$

$$= \underline{\underline{\$90,000}}$$

From TABLE 5-11
 JOINTLY:

$$\text{LINE 2: } 1275 + 0.07(90,000 - 21,250) = 1275 + 0.07(68,750)$$

$$= 1275 + 4812.50$$

$$= \underline{\underline{6,087.50}}$$

SEPARATELY:

$$\text{LINE 3: } 3393.75 + 0.0775(90,000 - 50,000) = 3393.75 + 0.0775(40,000)$$

$$= 3393.75 + 3100$$

$$= \underline{\underline{6493.75}}$$

$$\begin{array}{r} 6,493.75 \\ - 6,087.50 \\ \hline 406.25 \end{array}$$

$\underline{\underline{\text{IT WOULD BE } \$406.25 \text{ CHEAPER TO FILE JOINTLY.}}}$