Math 1010: Solutions to Practice Questions for Unit #1

1. Evaluate $22 + 3(2^3 - 5)^2$

   $= 22+3(8-5)^2$

   $= 22+3(3)^2$

   $=22+3(9)$

   $=22+27$

   $=49$

2. Evaluate $\dfrac{\$3{,}569}{1+0.0725\times\frac{85}{365}}$

   $= \dfrac{\$3569}{1.016883562}$

   = $3509.74

3. Solve for x in $x\left(1+0.075\times\frac{231}{365}\right)+\frac{x}{1+0.075\times\frac{7}{12}}=\$887.50$

   1.047465753x + 0.958083832x = $887.50

   2.005549586x = $887.50

   x = $442.52

4. What is ¾ % of 200?

   0.75% x 200

   = 0.0075 x 200

   = 1.5

5. What is 250% of 5?

250% x 5

= 2.5 x 5

= **12.5**

6. 400 g is what percent of 80 kg?

$$Rate = \frac{400\ g}{80{,}000\ g} \times 100$$

= 0.5%

7. Calculate the semi-monthly gross pay that is equivalent to an annual salary of $37,500.

Gross pay = $37,500 ÷ 24

= $1562.50

8. Convert an annual salary of $37,500 to an hourly rate paid biweekly based on a 37.5 hour work week.

Hourly Rate = $37,500 / 52 / 37.5

= **$19.23 per hour**

9. Ben's regular hourly rate of pay is $12.35. He is paid double time for any time worked over 40 hours per week. Calculate the number of overtime hours worked for one week in which his gross pay (including overtime) was $629.85.

Pay = Regular Pay + OT Pay

Regular Pay = $12.35 x 40 = $494

OT Pay = $629.85 - $494 = $135.85

OT Pay = 2 x $12.35 x OT Hours = $24.70 x OT Hours

Therefore, $135.85 = $24.70 x OT Hours

OT Hours = 5.5 hours

10. Carole is paid on a graduated commission scale of 2% on the first $10,000 of net sales in a month, 5% on the next $15,000, and 8% on all additional net sales in a month. What will she be paid for a month in which her net sales are $42,000?

Gross Pay = 2% x $10,000 + 5% x $15,000 + 8% x ($42,000-$25,000)

= $200 + $750 + $1360

= $2310

11. A group of consumers spend 30% of their disposable income on food, 20% of clothing and 50% on rent. If over the course of a year the price of food rose 10%, the price of clothing dropped 5% and rent rose 15%, what was the average price increase experienced by these consumers?

Weighted Average Increase = $\frac{30 \times 10 + 20 \times (-5) + 50 \times 15}{30+20+50}$

= **9.5%**

12. One year ago Gwen allocated the funds in her portfolio among 5 securities in the amounts listed in the following table. The rate of return on each security for the year is given in the third column of the table.

Security	Amount Invested	Rate of Return
Company A Shares	$5000	30%
Provincial B Bonds	$20,000	-3%
Company C Shares	$8,000	-15%
Units in Fund D	$25,000	13%
Company Y Shares	$4,500	45%

a. Calculate the average amount invested in each fund.

$$\text{Simple Average} = \frac{\$5{,}000 + \$20{,}000 + \$8{,}000 + \$25{,}000 + \$4{,}500}{5}$$

= **$12,500 per fund**

b. Calculate the average rate of return for the entire portfolio.

Weighted Average Rate

$$= \frac{\$5000 \times 30 + \$20{,}000 \times (-3) + \$8{,}000 \times (-15) + \$25{,}000 \times 13 + \$4{,}500 \times 45}{\$5{,}000 + \$20{,}000 + \$8{,}000 + \$25{,}000 + \$4{,}500}$$

$$= \frac{\$497{,}500}{\$62{,}500}$$

= **7.96%**

13. Solve for x in $8 - 0.5(x + 3) = 0.25(x - 1)$

8 - 0.5x – 1.5 = 0.25x – 0.25

8 – 1.5 + 0.25 = 0.25x + 0.5x

6.75 = 0.75x

x = 9

14. Solve for x in $\frac{3x}{1.025^6} + x(1.025)^8 = \$2641.35$

2.586890598x +1.218402898x = $2641.35

3.805293495x = $2641.35

x = $694.13

15. What is 55% of $500?

P = 55% x $500

= **$275.00**

16. $500 is 55% of what amount?

B = $\frac{\$500}{55\%}$

= **$909.09**

17. $55 is what percent of $500?

R = $\frac{\$55}{\$500} \times 100$

= **11%**

18. What is 550% of $50?

P = 550% x $50

= **$275.00**

19. The local newspaper has 30% of its readers subscribing, 45% purchasing the paper at the newsstand and the rest of its readers going on line to get the paper.
    a) If the paper has an average of 9,820 readers for each edition, how many readers are going on line to get the paper?

P = (100% - 30% - 45%) x 9820

= **2455** readers on line

    b) If the local town has a population of 212,000, what percentage of its residents read the paper?

$$R = \frac{9820}{212{,}000} \times 100$$

= **4.63%**

20. Ned and Amanda are renovating their home. They have budgeted $24,000 for the project.
    a) What percent is this cost of their combined gross monthly income of $7540?

$$R = \frac{\$24{,}000}{\$7540} \times 100$$

= **318.30%**

    b) If 68% of their gross monthly income is already consumed by rent, taxes and other bills, what percentage is this renovation project's cost of their remaining annual disposable income?

Remaining Annual Income = (100% - 68%) x 12 x $7540

= 32% x $90,480

= $28,953.60

$$R = \frac{\$24{,}000}{\$28{,}953.60} \times 100$$

= **82.89%**