Refresher Math Problem Set C3 –
Applying What You Have Learned About Arithmetic & Problem Solving

Ground Rules for Problem Set Completion

1. Present your work in a neat and organized manner. Use <u>complete sentences</u> whenever you are asked to make a statement.
2. SHOW YOUR WORK: Credit is awarded for all reasonable attempts based on the work shown.
3. Make sure you answer ALL parts of problems.
4. Complete and submit ALL Problem Sets for the unit prior to taking the Unit Test.

Purpose

This final Problem Set is intended to provide practice with skills and concepts covered throughout the course in contexts that simulate real life activities. In the three simulations you will have to use a variety of arithmetic skills and problem solving strategies.

I. ADJUSTING A RECIPE

Below is the list of ingredients needed to make a dozen Banana-Nut Muffins.

2 cups all-purpose flour	1 egg, beaten
1/4 cup sugar	1/3 cup vegatable oil
1 tablespoon baking powder	3/4 cup mashed banana
1/2 teaspoon salt	1/2 cup chopped walnuts
1 cup milk	

A. By what fraction should you multiply each ingredient to adjust the recipe to make eight muffins?
B. Calculate how much of each ingredient is needed to make eight muffins. Give your answers as proper fractions or mixed numbers in lowest terms.
C. By what fraction should you multiply each ingredient to adjust the recipe to make eighteen muffins?
D. State your answer to part C as (1) a mixed number and (2) a mixed decimal.
E. Calculate how much of each ingredient is needed to make eighteen muffins. . Give your answers as proper fractions or mixed numbers in lowest terms.

II. PLANNING A BUDGET

In this simulation you will create a hypothetical family budget.

A. Calculate your family weekly take-home pay based on the following information.
   <u>Your income</u>: 40 hours per week at $13.50/hr with 22% withheld for taxes & deductions
   <u>Spouse's income</u>: 25 hours per week at $10.50/hr with 18% withheld for taxes & deductions
B. Using the above information, calculate (1) the family's gross annual income and (2) the families average monthly take-home pay.
C. You receive a 35-cent per hour raise.
   1. What percent of your original hourly wage is this, to the nearest hundredth?
   2. How much does your family's gross annual income increase?
   3. How much does your family's average monthly take-home pay increase. Assume the percent withheld from your pay does not change.

D. Fill in the missing values of the monthly budget table below.

NOTES: 1. Percentages are based on your family's average monthly gross pay, using your income after the pay raise.

2. You need to calculate the "Miscellaneous" category using the percent of your family leftover after all other expenses have been met.

3. The income portion of the table is done for you, as an example.

Our Family Budget Planner				
	Average Weekly	Average Monthly	Annual Total	% of Gross Income
Income Items				
My Gross Income	$ 554.00	$ 2,400.67	$ 28,808.00	67.9%
Spouse's Gross Income	$ 262.50	$ 1,137.50	$ 13,650.00	32.1%
Total Income	**$ 816.50**	**$ 3,538.17**	**$ 42,458.00**	**100.0%**
Expense Items				
Car Insurance			$ 800.00	
Car Payment				7.5%
Car Repairs		$ 50.00		
Contributions				10.0%
Electric		$ 120.00		
Gasoline		$ 75.00		
Gifts			$ 1,200.00	
Groceries	$ 85.00			
Heat			$ 750.00	
Household				1.0%
Mortgage/Rent				15.0%
Medical				5.0%
Miscellaneous				
Personel Care		$ 50.00		
Phone		$ 60.00		
Recreation/Entertainment	$ 15.00			
Savings				10.0%
Taxes & Deductions				20.0%
Total Expenses				

III. PLANNING A TRIP

Your family is planning a vacation trip to Wildwood, NJ. You plan to stop overnight at friends in Hartford, CT on the way down, spend four nights at a motel in Wildwood, then travel straight home.

A. Your son printed out the attached travel data from the MapQuest web site (pages 5 – 7). Additionally, you kept track of your gas consumption for the past two weeks and found that you used 28.6 gallons while travelling 656 miles. Using this information, determine the following:

1. To the nearest half hour, what time you will arrive in Hartford if you leave Augusta at 7:30 AM, average 50 mph while driving, and make a 45-minute stop for lunch.

2. To the nearest half hour, what time you would have to leave Hartford so as to arrive at your motel in Wildwood at your check-in time of 2:30 PM provided you average 50 mph while driving, and make a 45-minute stop for lunch.

3. How long will the trip home take if you average 55 mph while driving, and make two 45-minute stops for meals. Give your answer to the nearest tenth of an hour.

4. Estimate, to the nearest dollar, the amount you will spend for gas on the trip using: (1) your 2-week consumption data to calculate a mileage rate (to the nearest mpg), (2) an average gasoline price of $1.40 per gallon, and (3) distances from MapQuest, plus 15% to cover local travel.

B. Your spouse printed out the room rate table below from web site of the motel where you will be staying. Using this information, determine the following:

1. How much will you have to pay, including tax, for four nights lodging in a luxury efficiency if you arrive in Wildwood on June 26?

2. How much more would you have to pay, including tax, for lodging in a deluxe efficiency as compared to a luxury efficiency for these same four nights?

3. How much more would you have to pay, including tax, for the luxury efficiency for four nights during the peak tourist season as compared to your planned arrival?

Rates: ALL RATES SUBJECT TO A 7% TAX

TYPE ROOM	A: DELUXE ROOM	B: LUXURY EFFICIENCY	C: DELUXE EFFICIENCY
5-1-99 TO 6-10-99	$39.99	$49.99	$59.99
6-11-99 TO 6-24-99	$59.99	$69.99	$79.99
6-25-99 TO 7-8-99	$69.99	$79.99	$85.99
7-9-99 TO 8-26-99	$85.99	$95.99	$99.99
8-27-99 TO 9-7-99	$59.99	$69.99	$79.99
9-8-99 TO 10-15-99	$39.99	$49.99	$59.99

C. In doing your meal expense planning you estimate that it will cost the family $15 for each breakfast, $20 for each lunch, and $35 for each dinner. Additionally, you plan to eat breakfast prior to starting your trip and your friends will be providing your family with supper and breakfast when you spend the night in Hartford. Using this information, estimate how much money you will need for meals.

D. You want to be able to enjoy the boardwalk attractions and buy souvenirs, so you allocate $125 per day for each of the four days you will be there.

1. What is the total amount that you have allocated for attractions and souvenirs?

2. Based on all your planning, what is the minimum amount that you should set aside for your trip? Give your answer to the nearest ten dollars.

3. If you want to take extra money so that you have a 10% cushion, what is the total amount you set aside for the trip? Give your answer to the nearest hundred dollars.

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<u>ANSWER KEY</u>

SECTION I: ADJUSTING A RECIPE

> 1 1/3 cups all-purpose flour   2/3 egg, beaten
> 1/6 cup sugar   2/9 cup vegatable oil
> 2/3 tablespoon baking powder   1/2 cup mashed banana
> 1/3 teaspoon salt   1/3 cup chopped walnuts
> 2/3 cup milk

A. $^2/_3$ B.

C. $^3/_2$ D1. $1^1/_2$ D2. 1.5

> 3 cups all-purpose flour   1 1/2 egg, beaten
> 3/8 cup sugar   1/2 cup vegatable oil
> 1 1/2 tablespoon baking powder   1 1/8 cup mashed banana
> 3/4 teaspoon salt   3/4 cup chopped walnuts
> 1 1/2 cup milk

E.

SECTION II: PLANNING A BUDGET

A. $636.45   B1. $41,730   B2. $2,757.95

C1. 2.59%   C2. $728   C3. $47.32

Our Family Budget Planner				
	Average Weekly	**Average Monthly**	**Annual Total**	**% of Gross Income**
Income Items				
My Gross Income	$ 554.00	$ 2,400.67	$ 28,808.00	67.85%
Spouse's Gross Income	$ 262.50	$ 1,137.50	$ 13,650.00	32.15%
Total Income	**$ 816.50**	**$ 3,538.17**	**$ 42,458.00**	**100.00%**
Expense Items				
Car Insurance	$ 15.38	$ 66.67	$ 800.00	1.88%
Car Payment	$ 61.24	$ 265.36	$ 3,184.35	7.50%
Car Repairs	$ 11.54	$ 50.00	$ 600.00	1.41%
Contributions	$ 81.65	$ 353.82	$ 4,245.80	10.00%
Electric	$ 27.69	$ 120.00	$ 1,440.00	3.39%
Gasoline	$ 17.31	$ 75.00	$ 900.00	2.12%
Gifts	$ 23.08	$ 100.00	$ 1,200.00	2.83%
Groceries	$ 85.00	$ 368.33	$ 4,420.00	10.41%
Heat	$ 14.42	$ 62.50	$ 750.00	1.77%
Household	$ 8.17	$ 35.38	$ 424.58	1.00%
Mortgage/Rent	$ 122.48	$ 530.73	$ 6,368.70	15.00%
Medical	$ 40.83	$ 176.91	$ 2,122.90	5.00%
Miscellaneous	$ 22.37	$ 96.95	$ 1,163.35	2.74%
Personel Care	$ 11.54	$ 50.00	$ 600.00	1.41%
Phone	$ 13.85	$ 60.00	$ 720.00	1.70%
Recreation/Entertainment	$ 15.00	$ 65.00	$ 780.00	1.84%
Savings	$ 81.65	$ 353.82	$ 4,245.80	10.00%
Taxes & Deductions	$ 163.30	$ 707.63	$ 8,491.60	20.00%
Total Expenses	**$ 816.50**	**$ 3,538.10**	**$ 42,457.08**	**100.00%**

D.

SECTION III: PLANNING A TRIP

A1. 1:30 PM   A2. 8:00 AM   A3. 11.3 hours   A4. $75

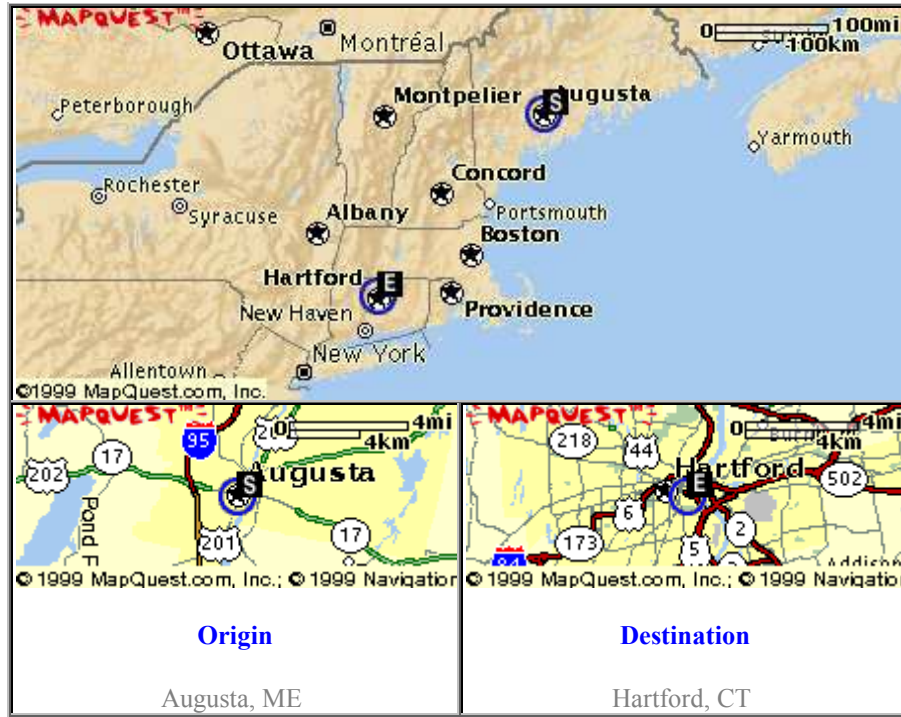B1. $342.36   B2. $25.68   B3. $68.48   C. $355

D1. $500   D2. $1,270   D3. $1,400

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Map It!
by MapQuest

Travelocity

Origin	Destination
Augusta, ME	Hartford, CT

City to City Directions

From:	Augusta, ME
To:	Hartford, CT

Direction	Distance
1: Go Northwest on US-202 to I-95 SOUTH.	1.6 miles
2: Go South on I-95 SOUTH (Portions toll) to I-295 (Exit 15).	50.1 miles
3: Go Southwest on I-295 (Portions toll) to MAINE TPK (I 495).	10.6 miles
4: Go Southwest on MAINE TPK (I 495) (Portions toll) to I-95 SOUTH. CONSTRUCTION: BETWEEN EXITS 4 AND 5.	39.1 miles
5: Go South on I-95 SOUTH to New Hampshire.	6.4 miles
6: Go South on I-95 SOUTH (Portions toll) to Massachusetts.	16.4 miles
7: Go South on I-95 SOUTH to I-495 (Exit 59).	2.1 miles
8: Go Southwest on I-495 passing by Haverhill, MA to I-290 WEST (Exit 25).	55.8 miles
9: Go West on I-290 WEST passing by Worcester, MA to I-90 WEST.	19.0 miles
10: Go West on I-90 WEST (Portions toll) to I-84 WEST (Exit 9).	12.4 miles
11: Go West on I-84 WEST to Connecticut.	8.7 miles
12: Go West on I-84 WEST passing by Hartford, CT.	33.8 miles
Total Distance:	256.0 miles

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Map It!
by MapQuest

Travelocity

Hartford, CT to Wildwood, NJ --
Map It! by MapQuest

Origin	Destination
Hartford, CT	Wildwood, NJ

City to City Directions

From:	Hartford, CT
To:	Wildwood, NJ

Direction	Distance
1: Go West on I-84 WEST passing by New Britain, CT to New York.	60.8 miles
2: Go West on I-84 WEST to I-684 SOUTH (Exit 20).	3.4 miles
3: Go South on I-684 SOUTH to CROSS WESTCHESTER EXPY (I 287).	29.2 miles
4: Go Northwest on CROSS WESTCHESTER EXPY (I 287) to I-287 WEST.	4.9 miles
5: Go West on I-287 WEST (Portions toll) to TAPPAN ZEE BRIDGE (I87/I287).	2.5 miles
6: Go West on TAPPAN ZEE BRIDGE (I87/I287) (Portions toll) to I-87 NORTH. CONSTRUCTION: ON THE BRIDGE(Tappan Zee).	3.8 miles
7: Go North on I-87 NORTH (Portions toll) to GARDEN STATE PKWY.	5.8 miles
8: Go South on GARDEN STATE PKWY (Portions toll) to New Jersey.	2.5 miles
9: Go Southwest on GARDEN STATE PKWY (Portions toll) passing by Paramus, NJ to NJ-147 (Exit 6).	164.9 miles
10: Go Southeast on NJ-147.	2.8 miles
Total Distance:	280.6 miles

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Map It!
by MapQuest
Travelocity

Wildwood, NJ to Augusta, ME --
Map It! by MapQuest

Origin: Wildwood, NJ | **Destination:** Augusta, ME

City to City Directions

From:	Wildwood, NJ
To:	Augusta, ME

Direction	Distance
1: Go Northwest on NJ-147 to GARDEN STATE PKWY.	2.8 miles
2: Go NE on GARDEN STATE PKWY (Portions toll) passing by Somers Point, NJ to New York.	164.9 mi.
3: Go North on GARDEN STATE PKWY (Portions toll) to I-87 SOUTH (Exit 14-1).	2.5 miles
4: Go South on I-87 SOUTH (Portions toll) to TAPPAN ZEE BRIDGE (I87/I287).	5.8 miles
5: Go East on TAPPAN ZEE BRIDGE (I87/I287) (Portions toll) to I-87 SOUTH. CONSTRUCTION: ON THE BRIDGE(Tappan Zee).	3.8 miles
6: Go South on I-87 SOUTH (Portions toll) to I-287 EAST (Exit 8).	1.5 miles
7: Go East on I-287 EAST to I-684 NORTH (Exit 9A).	5.9 miles
8: Go North on I-684 NORTH to I-84 EAST (Exit 9E).	29.2 miles
9: Go East on I-84 EAST to Connecticut.	3.4 miles
10: Go East on I-84 EAST passing by Waterbury, CT to Massachusetts.	94.6 miles
11: Go East on I-84 EAST to I-90 EAST.	8.7 miles
12: Go East on I-90 EAST (Portions toll) towards Worcester, MA to I-290.	12.4 miles
13: Go Northeast on I-290 towards Marlborough, MA to I-495 NORTH (Exit 26).	19.0 miles
14: Go North on I-495 NORTH passing by Lowell, MA to I-95 NORTH (Exit 56).	55.8 miles
15: Go North on I-95 NORTH to New Hampshire.	2.1 miles
16: Go North on I-95 NORTH (Portions toll) passing by Portsmouth, NH to Maine.	16.4 miles
17: Go North on I-95 NORTH (Portions toll) to I-295 (Exit 6A). CONSTRUCTION: EXITS 4 – 5.	45.5 miles
18: Go Northeast on I-295 (Portions toll) to I-95 NORTH.	10.6 miles
19: Go North on I-95 NORTH (Portions toll) towards Augusta, ME to US-202 (Exit 30).	50.1 miles
20: Go Southeast on US-202.	1.6 miles
Total Distance:	536.6 miles

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