PC 7.2 SYSTEMS WS with RREF

Name _____ Date _____ out of 26

1) Rafael, an exchange student from Brazil, made phone calls within Canada, to the United States, and to Brazil. The rates per minute for these calls vary for the different countries. Use the information in the following table to determine the rates.

Month	**Time within Canada (min)**	**Time to the U.S. (min)**	**Time to Brazil (min)**	**Charges ($)**
September	90	120	180	$252.00
October	70	100	120	$184.00
November	50	110	150	$206.00

Let **c** represent the rate for calls within Canada.
Let **u** represent the rate for calls to the United States.
Let **b** represent the rate for calls to Brazil.

Express the problem as a system of linear equations and then use rref in order to solve:

2) Calculate the number of minutes that Carlos called within Canada, to the United States, and to Mexico during the month of December. The charges are 28¢/min within Canada, 30¢/min to the U.S., and 84¢/min to Mexico if the following conditions applied:

- His total bill for the month was $90.96
- He talked twice as long to Mexico as he did to the U.S.
- The total number of minutes spent talking within Canada and to Mexico was 122.

Let **c** represent the number of minutes within Canada
Let **u** represent the number of minutes to the United States
Let **m** represent the number of minutes to Mexico

Express the problem as a system of linear equations and then use rref in order to solve:

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3) Tracy, Danielle and Sherri bought snacks for a girls' sleepover. They each bought the items shown in the following table at the local convenience store:

Number of bags of potato chips	**Number of litres of pop**	**Number of chocolate bars**	**Cost ($)**
4	4	6	21.00
3	2	10	20.88
2	3	4	13.17

Calculate the unit price of each snack purchased by the girls.

Let **c** represent the unit cost of the potato chips.
Let **p** represent the unit cost of the pop.
Let **b** represent the unit cost a chocolate bar.

Express the problem as a system of linear equations and then use rref in order to solve:

4) Solve this 4 by 4 system using rref.

$$\begin{aligned} 2x - 4y + 7z - 4w &= -1 \\ x + 4y - 2z + 9w &= 39 \\ x + y + z &= 6 \\ .4z - 8w &= -15.6 \end{aligned}$$

5) Make up your own 3 by 3 system that has solution (1, 1, 1).

6) Solve this system without using matrices. Use substitution or elimination.

$$\begin{aligned} x + y + z &= 6 \\ 2x - y + z &= 2 \\ 3x + y - 4z &= 0 \end{aligned}$$