Math 1320 Quiz Name KEY

You may use a calculator and your homework, but not your books or notes. There is one problem worth 20 points. **Show all of your work to receive full/partial credit.**

1) (#2 from 3.3) You own a hamburger franchise and are planning to shut down operations for the day, but you are left with 13 bread rolls, 19 defrosted beef patties, and 15 opened cheese slices. Rather than throw them out, you decide to use them to make burgers that you will sell at a discount. Plain burgers each require 1 beef patty and 1 bread roll, double cheeseburgers each require 2 beef patties, 1 bread roll, and 2 slices of cheese, while regular cheeseburgers each require 1 beef patty, 1 bread roll, and 1 slice of cheese. How many of each should you make?

Let x = # of plain burgers
y = # of double cheeseburgers
z = # of regular cheeseburgers

$x + 2y + z = 19$ ← beef patties
$x + y + z = 13$ ← bread rolls
$2y + z = 15$ ← cheese slices

Matrix:
$$\begin{bmatrix} 1 & 2 & 1 & 19 \\ 1 & 1 & 1 & 13 \\ 0 & 2 & 1 & 15 \end{bmatrix} R_2 = R_2 - R_1 \begin{bmatrix} 1 & 2 & 1 & 19 \\ 0 & -1 & 0 & -6 \\ 0 & 2 & 1 & 15 \end{bmatrix}$$

Row 2 means $-y = -6 \rightarrow y = 6$. Row 3 means $2y + z = 15$

so $2(6) + z = 15 \rightarrow z = 3$. Row 1 means $x + 2y + z = 19$

so $x + 2(6) + 3 = 19 \rightarrow x = 4$

so 4 plain burgers, 6 double cheeseburgers, and 3 reg. cheeseburgers