1. Find the slope, $x$-, and $y$-intercept of each line below. Then graph the line.

(a) $x$-intercept: 6; $y$-intercept: 4; $m = -\frac{2}{3}$

(b) $x$-intercept: -5; $y$-intercept: 7; $m = \frac{7}{5}$

(c) $x$-intercept: -2; $y$-intercept: 4; $m = 2$

2. Determine the solution type for each of the following systems of linear equations. For those with a unique solution, find that solution using one of the elimination, substitution, or matrix methods. You should use each method at least once.

(a) Unique Solution: (1,7) [top left]

(b) No Solution [top right]

(c) Infinitely Many Solutions, $x = 3 - \frac{3}{2}y$ [middle left]

(d) Unique solution: (-3,2) [middle right]

(e) Unique Solution: $x = 1, y = 4, z = 0$ [bottom left]

(f) No Solution (first equation is $x + y - z = 0$) [bottom right]

3. Identify each matrix as being in row echelon form, reduced echelon form, or neither. If a matrix is in neither form, indicate what keeps it from being both row echelon and reduced echelon form.

(a) Row echelon form (2 in first row, second column keeps it from being reduced).

(b) Reduced echelon form.

(c) Neither (the 3 in the second row, third column, needs to be a one).

4. Set-up and solve the following story problems involving systems of equations.

(a) Unknowns: $x =$ bags of Hearty Blend, $y =$ bags of Nature’s Best.
   Resources: Rice and Meat.
   Equations: $3x + 5y = 135 \quad 6x + 4y = 180$
   Solution: 20 bags Hearty Blend, 15 bags Nature’s Best.

(b) Unknowns: $x =$ bags, $y =$ gift boxes, $z =$ cookie tins.
   Resources: Chocolate Chip, Oatmeal, and Mint Cookies
   Equations: $x + 2y + 2z = 14 \quad x + y = 6 \quad y + 3z = 10$
   Solution: 2 bags, 4 gift boxes, and 2 cookie tins.
(c) Unknowns: $x$ = lbs. of almonds, $y$ = lbs. of cashews, $z$ = lbs. peanuts.

Resources: Nuts and Money.

Equations: $x + y + z = 100$ \hspace{1cm} $6x + 5y + 2z = 400$

Solution: $x = 3z - 100$ \hspace{1cm} $y = 200 - 4z$ One solution: 40 lbs peanuts, 20 lbs almonds, 40 lbs cashews

5. Using the matrices $X$, $Y$, and $Z$ on the review sheet, find:

(a) $\begin{bmatrix} 7 & -2 \\ -5 & 10 \\ 0 & -4 \end{bmatrix}$

(b) $\begin{bmatrix} 10 & 5 & 15 \\ 1 & 1 & 8 \end{bmatrix}$

(c) Not possible

(d) $\begin{bmatrix} 6 & 6 \\ 19 & -15 \end{bmatrix}$

6. Which was the value of $x_2$ in the matrix equation given on the review sheet?

C. The value of $x_2$ is 33.

7. Find the inverse of the matrix $A$ given on the review sheet.

$A^{-1} = \begin{bmatrix} 2 & -1 & 2 \\ 4 & -1 & 2 \\ 3 & -2 & 3 \end{bmatrix}$

8. Find the value of $b$ in the matrix multiplication shown on the review sheet.

From the matrix, $2a + 2a + 12 = 16$ and $2b - 4 = 2a$. Solving for $b$ yields $b = 3$. 