

### Math 166 Quiz 9 (Take-home)

1. A recent ad stated that a \$510,000 mortgage could be obtained for just \$1,698/month. Assume that this mortgage requires a 10% down payment, and has a fixed rate for 30 years. What is the rate? (Is this realistic? If not, our assumptions about the down payment, fixed rate, and/or number of years must be wrong.)

2. Solve for  $x$  and  $y$ :

$$\begin{bmatrix} x & 2 \\ 0 & 0 \end{bmatrix}^T - 3 \begin{bmatrix} 1 & y \\ 0 & 1 \end{bmatrix} \begin{bmatrix} 0 & x \\ 1 & 1 \end{bmatrix} = \begin{bmatrix} 6 & -6 \\ -1 & -3 \end{bmatrix}$$

3. A child makes two types of drinks to sell from her front yard stand: orange drink and lite drink. Each gallon of orange drink requires two quarts of juice, two quarts of soda water, and yields \$6 in sales. Each gallon of lite drink requires one quart of juice, three quarts of soda water, and yields \$2 in sales. Today she has one gallon of juice and one and a half gallons of soda water available. How much of each drink should she make in order to maximize sales? When sales are maximized, how much juice and how much soda water are used?

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