Show work. Your work is part of your answer. You may use a calculator.

Name: ____________________

1. Compute the amount we will have in 3 years if we earn interest compounded annually on \$200 at 4% APR.

2. If we invest \$200 at 4% APR (compunded continuously) how long before we have \$400.

3. Assume I deposit \$1000 per week for 35 years (assume 52 weeks per year) in my retirement fund. Assume the retirement fund earns 8% per year on average. That is,

$$WPR = (1.08)^{1/52} - 1 = 0.001481115792$$

where WPR is the weekly percentage rate. How is the account worth in 35 years?

4. Write the following system of linear eqations as an augmented matrix.

$$\begin{cases} 2x & -2y & = 8 \\ & y & = 2 \end{cases}$$

5. Solve the previous system of linear equations by Guass Jordan elimination. Reduce theh augemented matrix to RREF.

6. Let
$$A = \begin{bmatrix} 1 & 0 & 3 \\ -1 & 2 & 3 \end{bmatrix}, \mathbf{x} = \begin{bmatrix} x \\ y \end{bmatrix}, C = \begin{bmatrix} 1 & 2 \\ 1 & 0 \end{bmatrix}, \text{and } \mathbf{b} = \begin{bmatrix} 1 \\ 3 \end{bmatrix}.$$

(a) Compute AC

(b) Compute CA

(c) Compute $C\mathbf{x}$

(d) Compute C^{-1}

(e) Compute $C^{-1}\mathbf{b}$

7. Write the linear system below as a matrix multiplication problem as $A\mathbf{X} = \mathbf{b}$.

$$\begin{cases} 2x & +4y & = 0 \\ 3x & +5y = 1 \end{cases}$$

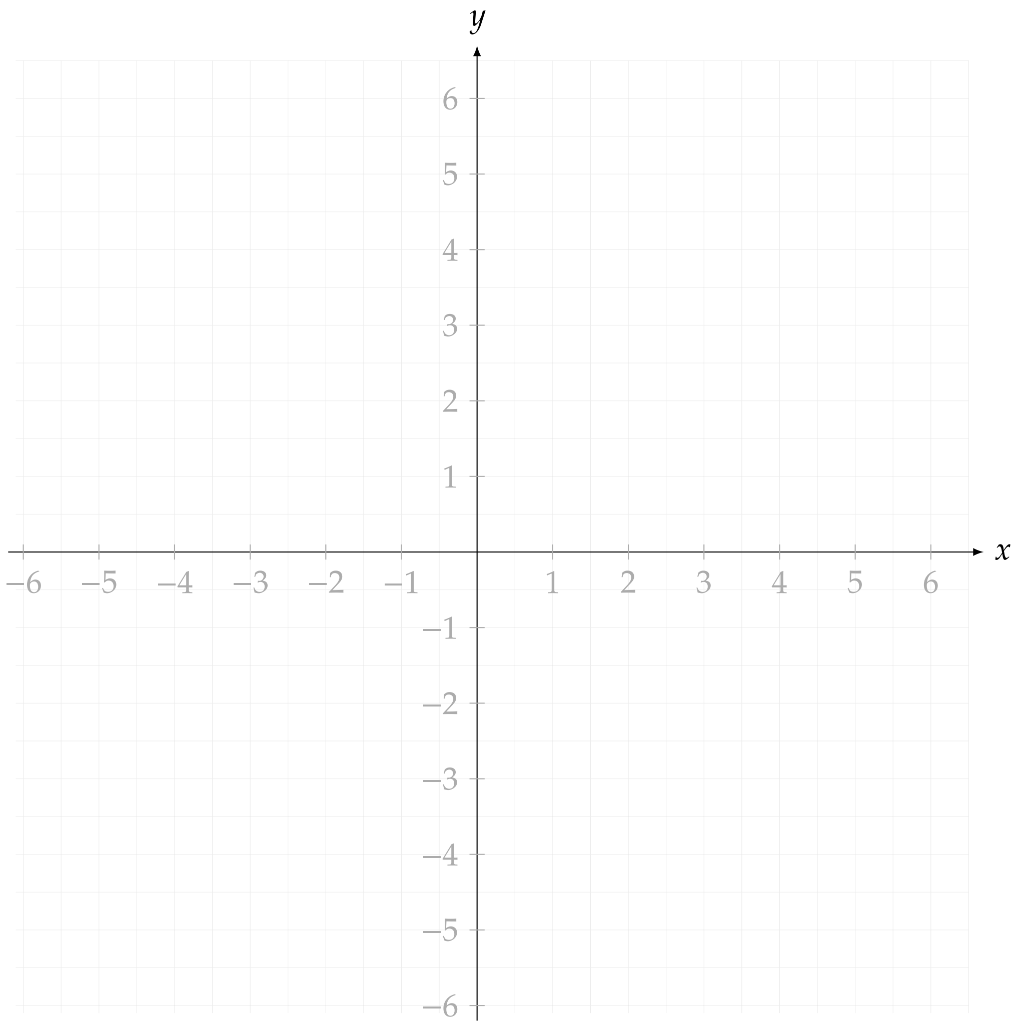
   (a) Identify A, $\mathbf{b}$, and $\mathbf{x}$.

   (b) Compute A^{-1} and $A^{-1}\mathbf{b}$.

   (c) Write down the solution to the system.

8. An economy is based on two industrial sectors, coal and steel. Production of a dollar worth of coal requires an input of \$0.10 from the coal sector and \$0.20 from the steel sector. Production of a dollar worth of steel requires an input of \$0.30 from the coal sector and \$0.50 from the steel sector. Find the output for each sector that is needed to satisfy a final demand of \$10 billion for coal and \$30 billion for steel.

9. Graph the feasible region for the following linear inequality. $3x - 2y \leq 6$, $x \geq 0$ and $y \geq 0$



- Simple Interest

  $A = P(1 + rt)$

- Compuond interest

  $A = P(1 + \frac{r}{m})^{mt}$, and $A = P(1 + i)^n$

- Continuosly compunded

  $A = Pe^{rt}$

- Future Value

  $FV = PMT\frac{(1 + i)^n - 1}{i}$

- Present Value

  $PV = PMT\frac{1 - (1 + i)^{-n}}{i}$

- Leontief Input output matrices

  $X = (I - M)^{-1}D$