DIRECTIONS: SHOW ALL WORK AND SET UPS FOR FULL CREDIT!

Solve the system algebraically.

1) $y = x^3 + x^2$

$y = -5x^2$

Solve the system by elimination.

2) $7x - 20 = 8y$

$2x - 3y = 10$

Find the inverse of A by hand if it has one, or state that the inverse does not exist. Show all work. [2]

3) $A = \begin{bmatrix} 0 & -6 \\ -4 & 6 \end{bmatrix}$

Solve the problem. Use your graphing calculator. [1]

4) Find the market equilibrium for the given supply and demand functions. Here y represents price and x represents quantity.

$y = 2600 - 90x$ (demand)

$y = 110x$ (supply)

Solve.

5) Find the dimensions of a rectangular enclosure with perimeter 40 yd and area 91 yd^2.

Answer the question.

6) $2x - 7y = -17$
$5x + 3y = 19$

If your friend was going to solve this system of equations by first eliminating y, what general suggestions would you make so your friend could start on this in a systematic way?

7) If the graphs of a system of two equations are a line and a parabola, what are the possible numbers of solutions (with real coordinates) of this system?

Use the graph to estimate any solutions of the system.

8) $x^2 + y^2 = 4$
$y = 2 + x$

[−5, 5] by [−5, 5]
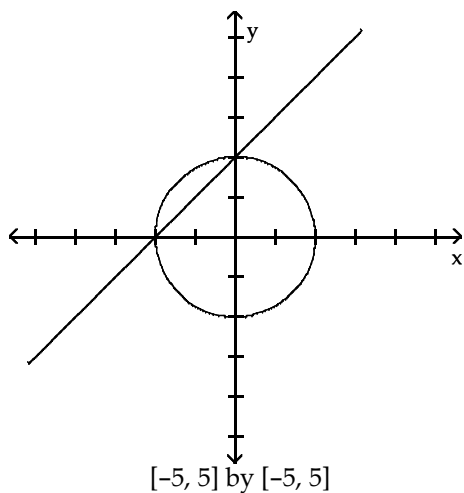
Find the matrix product, if possible. Show all steps by hand. [2]

9) $\begin{bmatrix} 8 & 5 & -6 \\ 9 & 2 & -1 \end{bmatrix} \begin{bmatrix} -3 \\ 5 \\ 5 \end{bmatrix}$

Find a matrix A and a column matrix B that describe the following tables involving credits and tuition costs. Find the matrix product AB, and interpret the significance of the entries of this product. [2]

10)

Credits	College A	College B
Student 1	6	9
Student 2	6	6

Cost	Tuition
College A	$86
College B	$65

Solve the problem.

11) The total number of cars sold at a used car lot for the years 1996 and 1997 was 688. The number of cars sold in 1997 was 3 times the number of cars sold in 1996. How many cars were sold in 1997?

1) $(0, 0)$ and $(-6, -180)$
2) $(-4, -6)$
3)
$$\begin{bmatrix} -\dfrac{1}{4} & -\dfrac{1}{4} \\ -\dfrac{1}{6} & 0 \end{bmatrix}$$
4) 13, \$1430
5) 13 yd by 7 yd
6) Answers may vary. One possibility: Multiply the first equation by 3, multiply the second equation by 7, and add the two resulting equations together. Solve the resulting equation for x. Substitute the solution for x into one of the original equations and solve for y. Finally, check your overall solution by substituting both values into the other original equation.
7) 0, 1, or 2
8) $(0, 2)$ and $(-2, 0)$
9)
$$\begin{bmatrix} -29 \\ -22 \end{bmatrix}$$
10)
$$AB = \begin{bmatrix} 1101 \\ 906 \end{bmatrix}$$
Tuition for Student 1 is \$1101 and tuition for Student 2 is \$906.
11) 516