

# HOMEWORK 5 - MATH 102

DUE DATE: Monday, March 12

INSTRUCTOR: George Voutsadakis

Read each problem **very carefully** before starting to solve it. Four out of the eight problems will be chosen at random and graded. Each problem graded is worth 3 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. Solve the following systems using the matrix method:

$$\left\{ \begin{array}{ccccccc} x & + & 2y & - & z & = & 0 \\ 2x & + & 3y & & & = & 3 \\ & & 2y & + & z & = & -1 \end{array} \right\} \quad \left\{ \begin{array}{ccccccc} 4x & + & 3y & - & z & = & 12 \\ 2x & - & 3y & - & z & = & -10 \\ x & + & y & - & 2z & = & -5 \end{array} \right\}$$

2. Let  $P(x) = 3x^2 - 2x + 5$  and  $Q(y) = -2y^2 + 3y - 1$ . Compute the following values  $P(0)$ ,  $Q(-2)$  and  $P(0) + Q(-2)$ .

3. Perform the indicated operations:

(a)  $(8x^2 - 6x + 3) - (4x + 2x^2 - 9)$

(b) Add  $(9y^3 + 3y - 7)$  and  $(-5y^3 - 6y + 2y^2 + 4)$

(c) Subtract  $(x + x^2)$  from  $(2x - 7x^2) + (7x - 2x^2)$

4. The cost  $C$  in dollars of producing  $x$  pairs of sunglasses is given by  $C(x) = 30,000 + 70x$ . Find the profit when 300 pairs of sunglasses are manufactured and sold if the revenue is given by  $R(x) = 210x - \frac{x^2}{25}$

5. Do the indicated multiplications:

(a)  $3x^4y^2(6x^3y^2 - 10x^2y + 5xy)$

(b)  $(x + 7)(x^2 + 5x - 2)$

(c)  $(3x - 1)(x - 5)$

6. Use the special products to do the operations:

(a)  $[(3x + 1) - 4y]^2$

(b)  $[3y + (5x - 2)]^2$

7. Factor completely:

(a)  $3x^3 + 18x$

(b)  $\frac{4}{5}y^9 - \frac{1}{5}y^7 + \frac{2}{5}y^6 - \frac{7}{5}y^5$

8. Factor completely:

(a)  $35x^3 + 7x^2 + 5x + 1$

(b)  $4a^7 - 8a^5 - 3a^4 + 6a^2$