HOMEWORK 6 - MATH 102

DUE DATE: Tuesday, October 30

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. Factor completely

$$(a)\ x^2 - 17x + 60 \quad (b)\ y^2 + 4y - 21$$

2. Factor completely

$$(a)\ 21x^2 - x - 2 \quad (b)\ 5x^5 + 22x^4y + 8x^3y^2 \quad (c)\ -14xy + 3x - 70y + 30$$

3. Factor completely

$$(a)\ 4x^2 - 28xy + 49y^2 \quad (b)\ 3 + 12x^2 + 4x^4 \quad (c)\ 9x^4 - 24x^2 + 16$$

4. Factor completely
   (a) $25x^2 - 36y^2$
   (b) $9x^2 + 6xy + y^2 - 1$
   (c) $9x^2 - 9y^2 + 6xz - z^2$

5. Factor completely

$$(a)\ x^3 + 8y^3 \quad (b)\ 8x^3 - 125y^3 \quad (c)\ (x - 4y)^3 - 1 \quad (d)\ 27 - (x^2 - y^2)^3$$

6. Factor completely
   (a) $-9x^4y - 9x^3y - 6x^2y - 6xy$
   (b) $12x^4y^2 - 36x^3y^3 + 27x^2y^4$
   (c) $-x^4 + 16x^2y^2$
   (d) $8x^8 + 27x^5y^3$

7. Solve the equations
   (a) $x^2 - 12x = -27$
   (b) $2x^2 - 3x - 20 = 0$
   (c) $x^3 - 4x^2 - 4x + 16 = 0$
   (d) $3x^3 + 3x^2 = 12x + 12$

8. (a) The distance d in meters traveled in t seconds by an object thrown downward with an initial velocity v_0 is given by the equation $d(t) = 5t^2 + v_0t$. If an object is thrown downward from a height of 28 meters with an initial velocity of 4 m/sec, how long does it take the object to reach the ground?
   (b) When the price of a ton of raw materials is $0.01x^2 + 5x$ dollars, a supplier will produce x tons of it. How many tons will be produced when the price is \$5000 per ton?