## HOMEWORK 6 - MATH 102 DUE DATE: Monday, March 19 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) 
$$x^2 - 17x + 60$$
 (b)  $y^2 + 4y - 21$ 

2. Factor completely

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

3. Factor completely

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

- 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) 
$$x^3 + 8y^3$$
 (b)  $8x^3 - 125y^3$  (c)  $(x - 4y)^3 - 1$  (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?