

American University of Beirut

Math 203

Quiz I Fall 2006-2007

Time: 70min.

Name.....

Student # :.....

- Circle your section number:

**Section 1: Th. @ 9:30**

**Section 3: Fr. @ 3:00**

**Section 2: Th. @ 11:00**

**Section 4: Fr. @ 4:00**

(35%) **Part I:** Multiple choices, with 2.5 points for each correct answer and -0.5 point penalty.

**Circle the correct answer.**

1.  $\sqrt[5]{\left(\frac{a^2}{b}\right)^3 \left(\frac{a}{b^{13}}\right)^{-1}} =$

A.  $\left(\frac{a}{b}\right)^2$       B.  $a b^2$       C.  $\left(\frac{a}{b}\right)$       D.  $a^2 b$

2.  $4^{-3} + \left(\frac{2}{16}\right)^{-2} - \frac{1}{2^6} =$

A.  $2^8$       B.  $2^6$       C.  $2^{-6}$       D.  $2^{-8}$

3. The equation of the horizontal line through  $(-2, 3)$  is:

- A.  $5x = -10$       B.  $3y = -6$       C.  $3x = 9$       D.  $2y = 6$

4. The roots of the quadratic equation  $3x^2 - 2x - 1 = 0$  are :

- A.  $-\frac{1}{3}$  and 1      B. 3 and -1      C. -3 and 1      D.  $\frac{1}{3}$  and -1

5. The coordinates of the midpoint of the line segment joining the two points A(2,5) and B(6,-3) are:

- A. (4, 1)      B. (4, -1)      C. (1, 4)      D. (1 -4)

6. The distance between the two points A(2,0) and B(2,-3) is
- A. 9                                      B. 4                                      C. 16                                      D. 3

7.  $\sum_2^4 x(x-3)^2 =$
- A. 2                                      B.-2                                      C.6                                      D.-6

8. The slope m and the y-intercept of  $5x + 3y = 30$  are :
- A.  $m = 5$  and (6,0)                                      B.  $m = \frac{-5}{3}$  and (0,10)
- B.  $m = 5$  and (0,10)                                      C.  $m = \frac{-3}{5}$  and (6,0)

9.  $\left(\left((-2)^{-3}\right)^{\frac{1}{5}}\right)^{10}$  is
- A.  $2^6$                                       B.  $\frac{1}{2^6}$                                       C.  $-2^{-6}$                                       D. impossible

10.  $-\left(\frac{1}{a^{-1}}\right)^{-2} =$
- A.  $-a^2$                                       B.  $-a^{-2}$                                       C.  $\frac{-1}{a^2}$                                       D.  $\frac{1}{a^2}$

11. The graph of the linear equation  $2x_1 - 5x_2 + 3x_3 = 7$  is :
- A. a straight line                                      B. a plane                                      C. not defined
- D. the given equation is not a linear equation.

12. The inequality  $|x^2 - 2| = -x$  has
- A. no solution                                      B. a unique solution
- C. exactly two solutions                                      D. exactly four solutions

13. The inequality  $|(x^2 - 5)(x - 1)(2 - x)| \leq -3$  has
- A. no solution                                      B. a unique solution
- C. infinitely many solutions                                      D. exactly two solutions

14. The equation  $2x - 3 = 5x - 2 - 3x + 1$  is

A. a conditional equation.

B. an identity

C. a contradiction.

D. a double equation.

(65%) **Part II:** Answer each of the following questions. (**Explain and show your work on the space provided**)

1. Simplify each of the following expressions:

(4%) a)  $\left(\frac{4}{5}\right)^{-3} \frac{2^4 \times 5^{-2}}{10} =$

(4%) b)  $\frac{\sqrt[5]{a^3} \times \sqrt{b^5} \times \sqrt{b} \times \sqrt[5]{a^{\frac{5}{2}} \times b^{10}}}{\sqrt[5]{a^8} \times \sqrt{b^2 a}} =$

The watermark logo features the word "insight" in a blue, rounded font, with "club" in a smaller blue font below it. The letters "i", "n", and "s" are in a light green color. A green horizontal line is positioned below the "insight" text. The entire logo is enclosed in a light green rectangular border.

(4%) c)  $\sqrt{1 + 2\sqrt{6 + 2\sqrt{9 + 4^2}}}$

(4%) **d)**  $\sqrt{25x^8y^4 + 50x^7y^4 + 25x^6y^4} =$

2. Solve the following equations:

(4%) **a)**  $3|4x - 1| + 17 = 5$



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(7%) **b)**  $|x^2 + 5x - 2| = 5x + 2$

3. Factorize each of the following polynomials **completely**:

(4%) **a)**  $16x^2 + 10xy - 24x - 15y =$

(4%) **b)**  $x^2 + 6x + 9 - y^2 =$

(4%) **c)**  $16x^5 - 81x =$



(4%) **d)**  $x^2 + 2x - y^2 - 6y - 8 =$

4. Solve the following inequalities:

(4%) **a)**  $2x^2 - 12x + 18 \leq 0$



(4%) c)  $-4(x-1)^2 \geq 0$

(7%) d)  $\frac{(x^2 - 4)(x + 5)}{(x + 7)} \leq 0$

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