BRONX COMMUNITY COLLEGE
of the City University of New York

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

MATH 05   Second Exam II

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Print Name: _____

Please do not turn this cover sheet until instructed to do so.

When the exam begins, please write your name on on the front page.

Please read the questions carefully and write your answers in the spaces provided on the question sheets. Justify your answers. **No credit will be given for unjustified answers.** Simplify your answers as far as you can. If you run out of room for an answer, continue on the back of the page.

Check your working carefully before submitting your paper.

There is a total of 2900 points. The perfect score however is 2600 points. There are 300 points of **Extra Credit**.

Calculators, computers, mobile phones and other electronic devices are not permitted.

You are required to turn in *all* of the question sheets with your name written in the top right-hand corner of the first page.
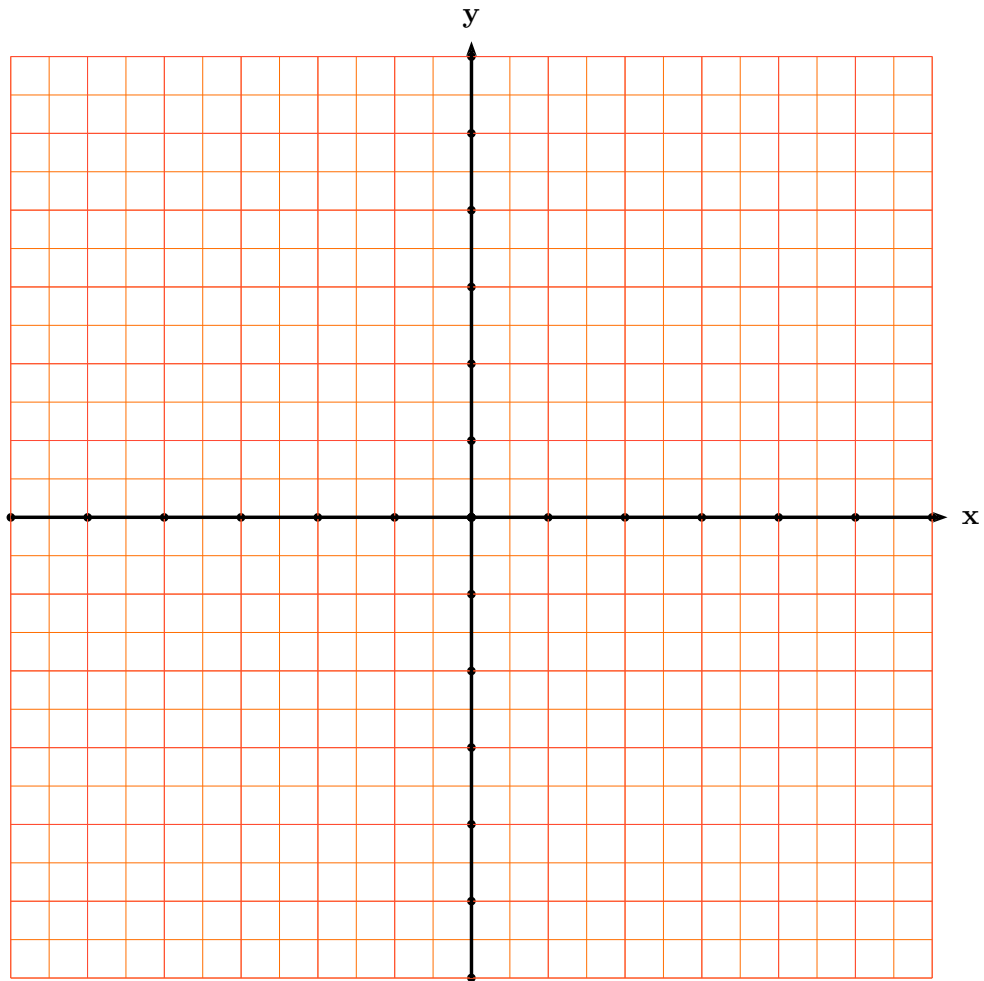
1. (150 points) Find the equation of the line that is parallel to the line $2x - 4y = -2$ and passes through the point $(2, 3)$.

2. (150 points) Find the equation of the line that is perpendicular to the line $y = \dfrac{3}{2}x - 6$ and passes through $(0, -2)$.

3. (200 points) Graph each of the following lines on the space provided:

   (a) $x - 2y = 4$

   (b) $y = -3$

4. (200 points) Find the co-ordinates of the intersection of the lines in the previous question *without using the graph.*

5. (250 points) Find the equation of the line that passes through the midpoint of the segment with endpoints $(4, 2)$ and $(-2, 6)$, and the x-intercept of the line $y = 2x - 6$.

6. (200 points) Solve for x and y:

$$\begin{cases} 4x - y = 2 \\ 2x + 3y = 8 \end{cases}$$

7. (150 points) Simplify: $\left(\dfrac{2x^2y^3}{z^4}\right)^2 (x^3yz)^3$

8. (150 points) Simplify: $\dfrac{9x^4y - 42x^3}{3x^2}$

9. (200 points) Perform the division: $\dfrac{4x^3 + 8x^2 - 2x - 6}{x + 2}$

10. Consider a rectangle with sides $3x + 2$ and $2x - 1$.

    (a) (100 points) Find a polynomial representing the perimeter of the rectangle.

    (b) (150 points) Find a polynomial representing the area of the rectangle.

    (c) (200 points) If the area of the rectangle is 5 square units, find its sides.

11. Factor completely each of the following:

   (a) (150 points) $2a^2b^3 + 2abz - 3ab^2 - 3z$

   (b) (150 points) $27z^3 + 8$.

   (c) (150 points) $50x^2 - 18$.

   (d) (150 points) $x^2 + 100$.

   (e) (200 points) $8x^2 - 15x - 2$