BRONX COMMUNITY COLLEGE
of the City University of New York

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

MATH 05X   Exam 2
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Directions: You should fully justify your answers. Do all your work on separate paper, and make sure to *print* your name in the first sheet and staple all the sheets together. **Unstapled, loose pieces of paper will not be graded.** This exam is due on Monday, July 14, at 6:00pm.

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1. Evaluate: $-5 - 2(9 - 12) + 6^2 \div 4 \cdot 2$.

2. Evaluate: $\dfrac{5}{24} \cdot \dfrac{-8}{-35} \cdot \dfrac{14}{9} \cdot \dfrac{-18}{10} \cdot \left(-\dfrac{3}{7}\right)$.

3. Evaluate each of the following expressions when $x = 3$ and $y = -4$.

   A. $(x - y)^2$ B. $x^2 - 2xy + y^2$

4. Solve the equation:
$$10 - 3(2x - 4) = -3(x + 5) - 2x + 42$$

5. Solve the equation:
$$\frac{2x - 1}{3} + \frac{x + 4}{6} = 3x - 4$$

6. Solve the following inequality, give the answer using interval notation and graph the solution set.
$$2 - 5(2x + 1) < 2x + 9$$

7. Find the slope and the y–intercept of the line with equation:
$$4x - 2y = 9$$

8. Find the equation of the line that is parallel to the line $y = \dfrac{4}{5}x + 7$ and passes through $(5, 6)$.

9. Find an equation of the line whose graph is shown in Figure 1.

10. Solve the following inequality: $2x - y \geq 6$.

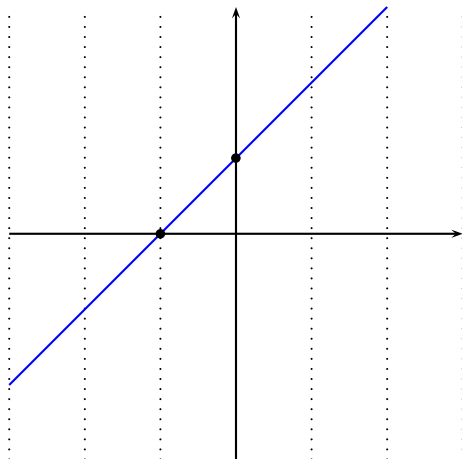11. Graph each of the following lines on the same grid:

Figure 1: The line of Question 9

(a) $x + y = 3$

(b) $x = 2$

Find the co-ordinates of the intersection of the two lines. Check your answer algebraically.

12. Solve the following system:
$$\begin{cases} 4x - 3y &= 1 \\ 2x + 3y &= 5 \end{cases}$$

13. Solve the following system:
$$\begin{cases} 2x - 3y &= 4 \\ 4x - 5y &= 10 \end{cases}$$

14. Simplify: $\left(\dfrac{3x^4 y^3}{4z^2} \right)^2 (-xy^2 z^2)^4$.

15. Simplify: $\dfrac{9x^4 y^4 - 42x^3 xy^2 + 12x^4 y^3}{-3xy^2}$

16. Perform the following operations and simplify your answer as much as possible:
$$(x - 2y)(x + 2y) - (x + y)^2 + (2y - 1)^2$$

Hint. To find $(x + y)^2$ you need to do the multiplication $(x + y)(x + y)$.

17. Perform the division: $\dfrac{2x^2 + x - 21}{x - 3}$

18. A chemist mixes 20% alcohol solution with 40% alcohol solution and obtains 100 ml of 35% solution. How much of each solution was mixed?

19. I have some dimes and some quarters. The number of quarters is 5 less than twice the number of dimes. If the total value of all the change that I have is $2.35, how many dimes and how many quarters do I have?

20. The length of a rectangle is 7 inches more than 4 times its width. If the perimeter of the rectangle is 74 inches find its dimensions.