DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

MATH 05   Exam 2

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Name: _____   Secret Name: _____

Directions: You *must* show all your work in the provided space. Simplify your answers whenever possible. Be certain to indicate your final answer clearly. **This exam is due Monday May 8, 10:00 AM**
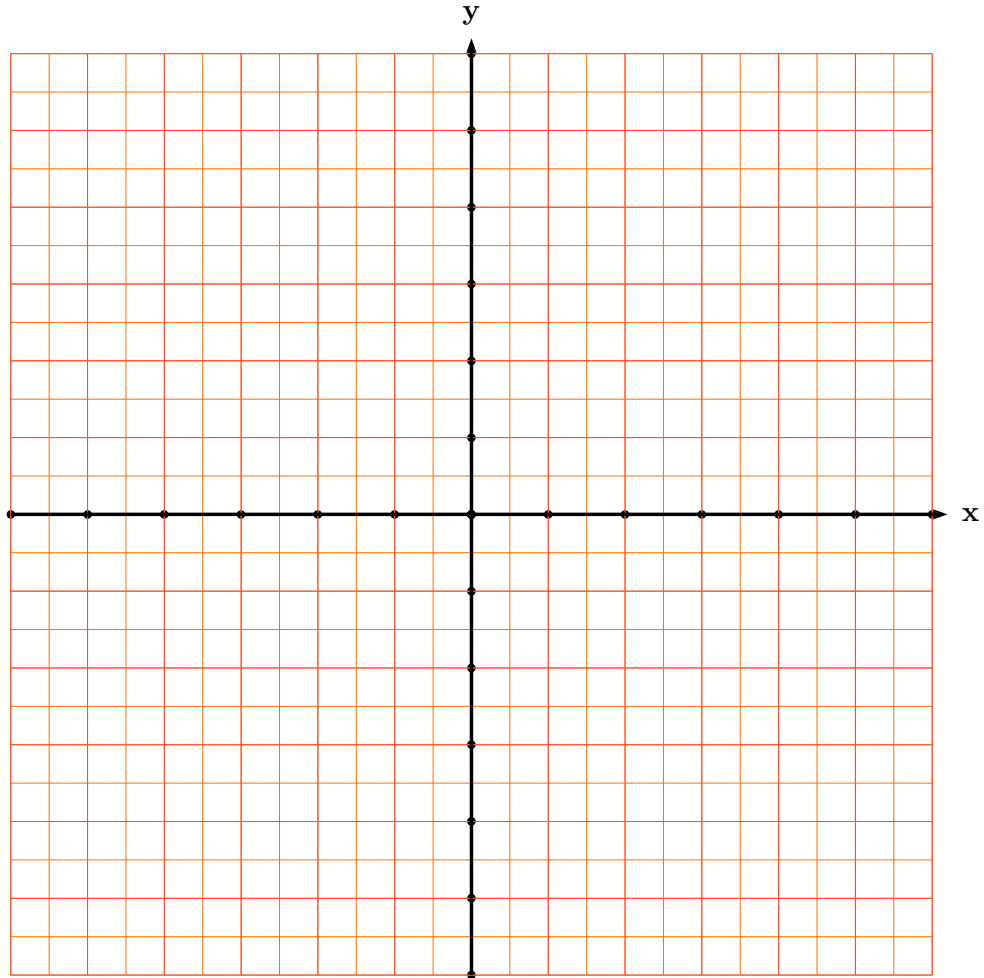
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1. Find the equation of the line that is parallel to the line $y = \dfrac{4}{5}x + 7$ and passes through $(5, 6)$.

2. Find the equation of the line that is perpendicular to the line $y = -3x - 5$ and passes through the point $(0, 3)$.

3. Graph each of the following lines on the space provided:

   (a) $x + y = 3$

   (b) $x = 2$

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

5. The area of a rectangle is given by the polynomial $6x^2 + 7x - 3$ and one of its sides is given by $2x + 3$.

   (a) Find the other side.

   (b) Find the perimeter of the rectangle.

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

7. Solve for x and y:

$$\begin{cases} 4x - 3y & = 1 \\ 2x + 3y & = 5 \end{cases}$$

8. A jet flew east a distance of $1,800$ with the jetstream in 3 hours. Returning west, against the jetsream the jet took 4 hours. Find the jet's speed in still air and the rate of the jetstream.

9. Solve for x and y:

$$\begin{cases} 2x - 3y = 4 \\ 4x - 5y = 10 \end{cases}$$

10. Simplify: $\left(\dfrac{3x4y^3}{4z^2}\right)^2 (-xy^2z^2)^4$.

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

12. Perform the division: $\dfrac{5x^3 - 4x^2 + 3x - 1}{x - 3}$

13. Factor completely each of the following:

    (a) $6x^2y + 10xy^2 - 15x - 25y$

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

    (c) $x^2 + 100$.

    (d) $40x^2 - 90$.

    (e) $x^2 + 3x - 28$

    (f) $6x^2 + x - 2$

14. If the area of the following rectangle is 6 square units find its length and its width.

$x - 1$ (left side)

x (bottom)