

HOMEWORK 4 - MATH 102

DUE DATE: Monday, October 8

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. (a) Find the slope of the line that is perpendicular to the line passing through the points $A(7, -3)$ and $B(-2, 15)$.
(b) Graph the line with slope -3 passing through the point $A(-4, 7)$.
2. (a) The line through the points $(6, \frac{1}{2}c)$ and $(8, 2c)$ is perpendicular to another line whose slope is 2. What is the value of c ?
(b) Find the equation of the line passing through the points $(3, 2)$ and $(-5, 8)$. Write the equation on the standard form.
3. (a) Find the slope-intercept form of the equation of the line passing through $(-3, 5)$ and perpendicular to the line with equation $2y - x = 5$.
(b) Find the equation of the line that has undefined slope and passes through the point $(4, -5)$.
4. (a) Find the equation of the line that passes through the point $(1, 1)$ and is parallel to the line with equation $6y - 2x = 5$.
(b) Find the equation of the line passing through $(-1, 4)$ and $(5, 2)$, write it in the standard form and then graph the line.
5. Graph the solutions to the following inequalities:
(a) $3x - 2y \leq 6$
(b) $-5x + 2y > 10$
6. Graph the solutions to the following inequalities:
(a) $|y| \geq 4$
(b) $|x + 2| \leq 1$
7. (a) Solve the following system by the substitution method: $\begin{cases} 2x - 5y = -29 \\ 3x + y = -1 \end{cases}$
(b) Solve the following system by the elimination method: $\begin{cases} x - 4y = 30 \\ x + 3y = -19 \end{cases}$
8. The total number of nuclear reactors in the US is 160 but not all of them are in operation. The number of operable reactors is four more than double the number of inoperable reactors. Write down a system of two equations in two variables and then solve it to find how many reactors in the US are operable and how many are inoperable.