ALGEBRA PROBLEM SESSION #3 - PRACTICE PROBLEMS

Slopes and Intercepts

1. If you were given the standard form of an equation, explain how to find the x-intercept; the y-intercept?
2. The graph of a linear equation has no points in Quadrants I and II. What must the slope of this line be?
3. Explain as you would to a fellow student how the numerical value of slope can be used to describe slant and the steepness of a line.
4. What does it mean if the slope of a line is zero? Is undefined?
5. Find the slope and y-intercept of the line: $2x = -4y + 6$.
6. The slope of a line perpendicular to a given line is equal to the negative multiplicative inverse of the slope of the given line. Write the equation of both lines if they intersect at the origin.
7. Use intercepts to graph: $4x - 3y = 6$ $y = 5x - 3$ $2y = 3x - 4$ $3x = 2y - 8$ $x - y = -9$ $4x + 6 = -2y$
8. Find the slope of the line containing the points: (-1, 5) and (-6, 3) b. (0, 2) and (5, 0) c. (-1, 1) and (0, 1)
9. Find the slope and y-intercept and then graph: a. $3y = 2x + 1$ b. $5(x + y) = 12$ c. $7x - 3y = 5$

Graphing Linear Equations

1. If you know a point on a line and you know the equation parallel to this line, explain how to write the line's equation.
2. The points (3, a), (5, 7), and (7, 10) lie on a line. Find a.
3. The line passing through points A(1, 3) and B(-2, 7) is perpendicular to the line passing through points C(4, b) and D(8, -1). Find b.
4. Find the slope and equation of a line parallel and perpendicular to each indicated line.
   $3x - y = 3$ $3y - 2x = 18$ $x - y = 7$ $3x + 2y = 12$
5. How will the graph of $y = \frac{1}{2}x + 5$ compare to the graph of $y = \frac{1}{2}x - 5$?
6. How will the graph of $y = \frac{1}{2}x - 5$ compare to the graph of $y = \frac{1}{2}x$?
7. If the graph of $y = ax + b$ passes through quadrants I, II, and IV, what can be known about the constants a and b?
8. The graph of $Ax + By = C$ passes only through quadrants I and IV. What is known about the constants A, B, and C?
10. Explain how you would derive the equation of a line perpendicular to $x = 4$ with a y-intercept of 3.
11. Write the equation of a line that is perpendicular to the line $Ax + By = C$ and that passes through the origin.
12. The slope of a line perpendicular to a given line is equal to the negative reciprocal of the slope of the given line. Write the equation of both lines if they intersect at the origin.
13. Find the equation of the line with the given information: a. y-intercept (0, -1) and slope = $\frac{-3}{4}$

    b. point (3, -5) with slope = -2 c. point (0,-5) with slope = 9

13. Graph the line that is parallel to the line $-2x = y + 2$ and has a y-intercept of (0,7).
14. Graph the line that is perpendicular to the line $x + 5y = 27$ and passes through (2, 5).

Selected problems were taken from Blitzer Algebra For College Students