

Math 127: Review for Test 1

Review Problems: Chapter 3 Test, pg 256: 3 – 19 ALL

Chapter 4 Test, pg 321: 1, 2, 3, 7, 9, 10, 17; also review 4.5, #41 and #43

Chapter 9 Test, pg 656: 3 – 15 ALL, 19, 20

- Graph linear equations by
 - plotting points (create a table of values, i.e. a t-chart)
 - finding the x-intercept and y-intercept (set $y=0$, solve for x / set $x=0$, solve for y)
 - plotting the y-intercept and using the $\text{slope} = \frac{\text{rise}}{\text{run}}$ to find another point on the line
- Find the slope of a line:
 - from a graph: $\text{slope} = \frac{\text{rise}}{\text{run}}$
 - from two points: $m = \frac{y_2 - y_1}{x_2 - x_1}$
 - from an equation: solve the equation for y to get the line equation $y = mx + b$.
 - parallel lines: have the same slope
 - perpendicular lines: slopes are OPPOSITE in sign and RECIPROCAL
- Find the equation of a line: As soon as you see the words "FIND THE EQUATION OF THE LINE ..." write down the point-slope equation: $y - y_1 = m(x - x_1)$. Find the slope given the information about the line, then substitute a point for (x_1, y_1) and the slope for m .
- Horizontal lines: Equation is of the form $y = b$ (e.g., $y = 1$). SLOPE IS 0.
- Vertical lines: Equation is of the form $x = a$ (e.g. $x = 2$). SLOPE IS UNDEFINED.
- Graph the solution to a system of 2-variable inequalities. Use 1, 2, 3 as in (1) Graph the boundary line, (2) Choose dashed or solid line and (3) Test a point and shade the TRUE side.
- Two-variable systems of linear equations
Methods of solution: Elimination, Substitution, Graphing
KEY POINT: The solution you find by using substitution or elimination is the intersection point when you graph the equations!
- Three-variable systems of linear equations and Applications
Method of solution: Use elimination on two different pairs of equations to eliminate a variable (same one each time) to create two new equations which have only 2 variables. Solve this new system.
Types of systems: **Consistent** (with one solution),
Dependent (with infinite solutions --- variables cancel out and leave a true statement, like $0 = 0$)
Inconsistent (with no solutions --- variables cancel out and leave a false statement, like $0 = 5$)
- Applications of systems : Types of problems that you've set up using three variables: Number, Interest, Resource
- Inequalities Types of problems: AND, OR, absolute value. Be able to solve, graph the solution on a number line and write the solution in INTERVAL NOTATION.

Absolute value facts: $|x| < a \Rightarrow -a < x < a$ (this is the same as $x < a$ AND $x > -a$)

$|x| > a \Rightarrow x > a$ OR $x < -a$

- Absolute value equations:
KEY POINT: when you remove the absolute value symbol, the equation splits into two. You also MUST check your answer in the original equation.
 $|x| = a \Rightarrow x = a$ $x = -a$
- Sets, union, intersection: remember " \cup " stands for "union" which means join together; " \cap " stands for intersection, which means the parts that overlap, what's in common.