Math 120 Midterm One mechanical skills summary

The following are some of the mechanical skills necessary to do well in Math 120. It will be worthwhile to make sure these skills are quite sharp for the first midterm.

- Unit conversion: "multiply by one" method
- Distance formula: find the distance between two points.
- lines
  - Find the equation of the line through two given points.
  - Find the equation of a line given its slope and one point on the line.
  - Find the equation of a line perpendicular to a given line through a given point.
  - Find the point on a line that is closest to a given point not on the line.
- circles
  - Find the equation of a circle given its center and radius.
  - Find the center and radius of a circle given its equation (in any form).
  - Find the equation of a line, tangent to a given circle, which passes through a given point.
  - Find the points of intersection of a line and a circle (how does this process differ when the line is vertical, horizontal, or neither?)
- Uniform linear motion
  - Find the parametric equations of motion of an object exhibiting uniform linear motion:
    - Given the start point and another point together with its corresponding time.
    - Given two points and two corresponding times.
    - Given the start point, another point, and the speed.
    - Given the start point, the line of motion, and the speed and direction.
- Areas
  - Area of a triangle (with a vertical or horizontal side) specified by three points in the plane with area$=\frac{1}{2}bh$ formula.
  - Area of a trapezoid given lengths of two parallel sides and distance between them
  - Area of a rectangle
  - Area of a circle
- Multipart functions
  - Express $|x|$ as a multipart function and use this to express any function of the form $|f(x)|$ as a multipart function.
  - Solve equations involving multipart functions.
- Quadratic functions
  - Find the quadratic function specified by three points.
  - Find the quadratic function specified by its vertex and one other point.
  - Find the vertex of a given quadratic function. Determine whether this is the highest or lowest point on the graph of this function.
  - Find the maximum and minimum values of a quadratic function on a specified interval.