Lockpicking

Mechanical lockpicking is represented by geometric constructions with a compass and straightedge. Each lock will have a geometric figure you must reconstruct to open the lock.

A lock may also have a **difficulty level.** Once you have completed the geometric figure, you must (fairly) flip a coin that number of times: if all come up heads, you succeed; if any are tails, you must start over and re-reconstruct the figure. If the level is 0, or the lock has no level, no coin flipping is required. If you have a **bonus level**, subtract it from the difficulty level.

Equipment for lockpicking is physrepped by a compass, a straightedge, a pad of paper, and a coin. The GMs will supply compasses and straightedges, but you may bring your own. GMs will not supply paper or coins.

You may:

- Use the compass to draw arcs.
- Use the compass to mark off distances.
- Use the straightedge to make straight lines.

You may not:

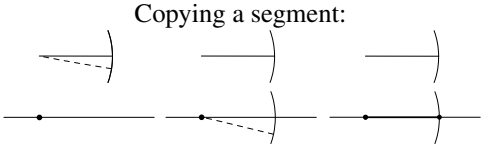
- Use your straightedge as a ruler.
- Use lined paper for your constructions.
- Guess an angle.
- Guess a distance or location.

In general, if you want to put the little pointy end of the compass down on the paper, unless it's the first stroke of the figure, you need to put it down on a pencil line or intersection. Likewise, if you want to draw a straight line, it's usually going to be a straight line between two points.

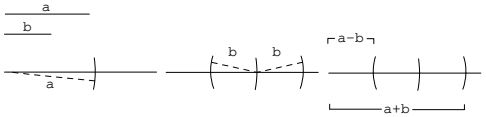
Easy locks should be straightforward from the examples below. More difficult locks may require some thinking and/or several steps. Most geometric constructions can be solved in multiple ways, usually with a trade-off between complexity of construction and thinking, but in general if you know one solution it is a bad idea to try to find a better one during a mission.

Elementary operations: You should be able to do these very well.

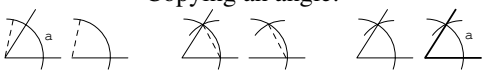
Copying a segment:



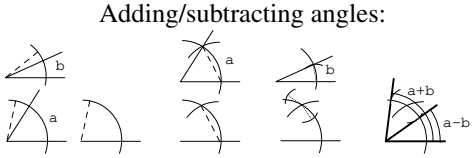
Adding/subtracting segments:



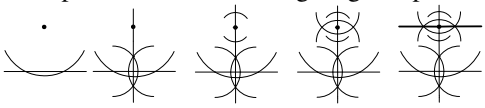
Copying an angle:



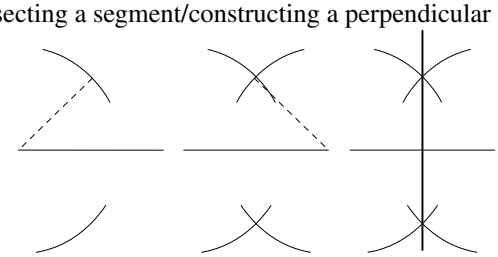
Adding/subtracting angles:



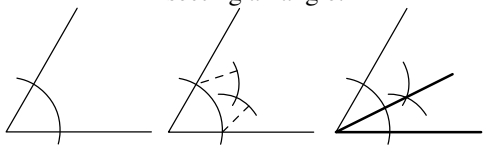
Line parallel to a line through a given point:



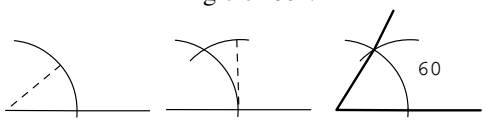
Bisecting a segment/constructing a perpendicular line:



Bisecting an angle:



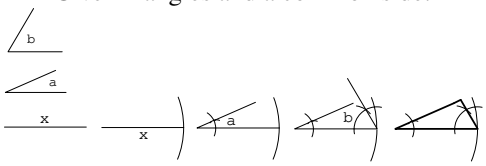
Angle of 60°:



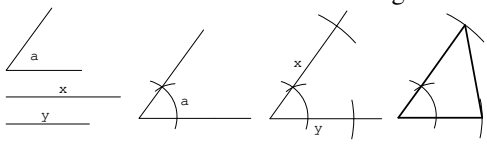
Other common angles include 30° (= 60°/2) and 45° (= 90°/2).

Triangles: You should be able to do these well.

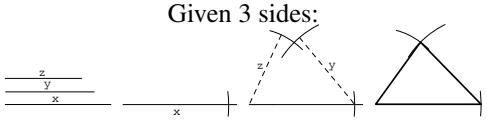
Given 2 angles and a common side:



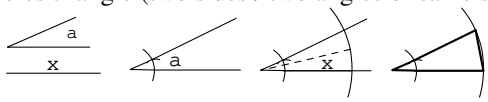
Given 2 sides and a common angle:



Given 3 sides:

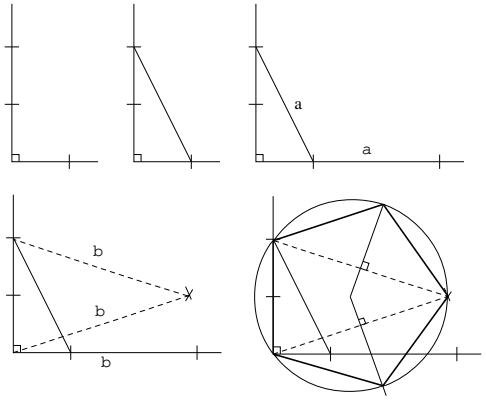


Isosceles triangle (two sides / two angles of same size):

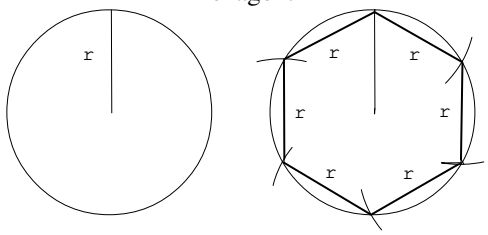


Regular polygons: You should be able to do these.

Pentagon:

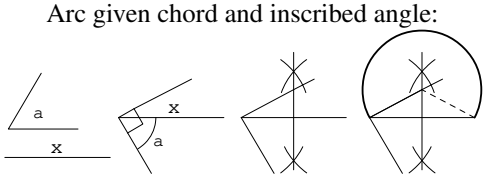


Hexagon:



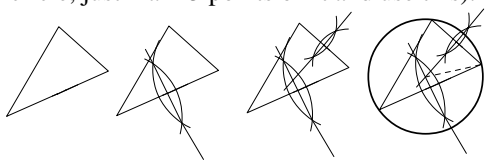
Other operations: You may want to understand these if you need to improvise.

Arc given chord and inscribed angle:



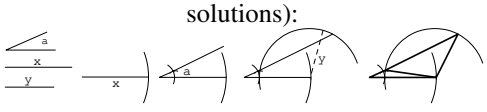
Segment of size $\sqrt{a^2+b^2}$:
get hypothenuse of a right triangle with cathetus a and b.

Circumcircle of a given triangle (for the center of a given circle, just mark 3 points on it and use this):



Other triangles: Constructions provided for informative purpose; you are not likely to need these.

Given 2 sides and non-common angle (note that there are 2 solutions):



Given 2 angles and other side (note that there is a different solution if you switch the sides):