The Magic Circle
Construction

Developed by
The Alexandria Seaport Foundation
and
The United Brotherhood of Carpenters

The Tools Needed

- Compass
- Straight-edge
- Pencil
- Paper (not graph paper, 8.5 x 11 is fine)
- Your Brain (the most important tool!)

Why learn math?

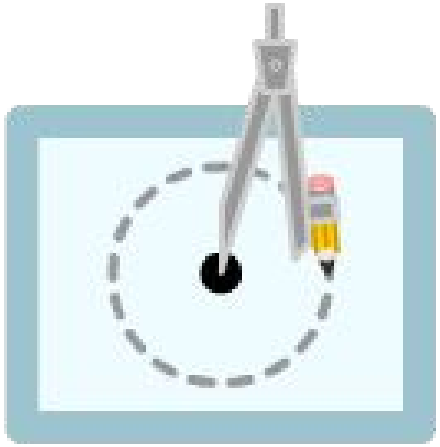
- You can't lay anything out without geometry
- You can't measure without fractions
- You can't estimate without areas

Getting Started

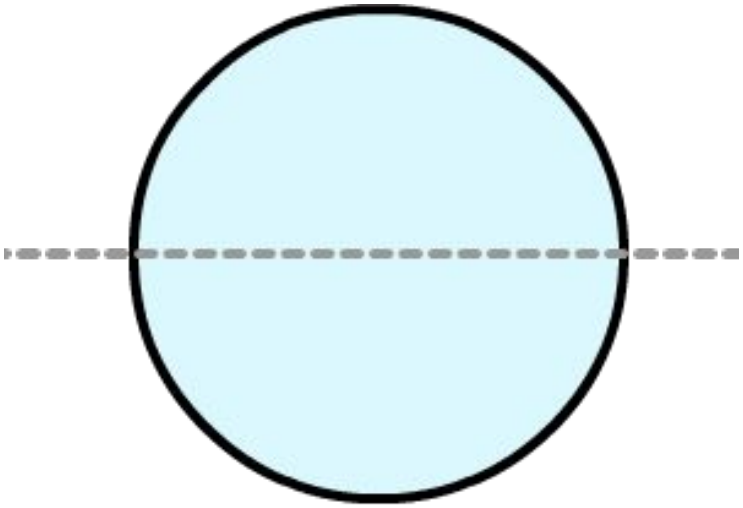
- Place three sheets of paper on top of one another. Orient them sideways, horizontal or “landscape view.”
- Use a pencil to make a dot in the approximate center of the paper
- Set the compass, so the distance is approximately the length of your thumb

Procedures

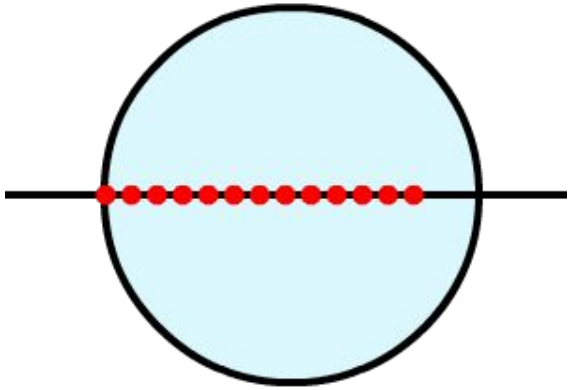
- Put the metal point of the compass on the dot in the center of the paper and draw a circle.

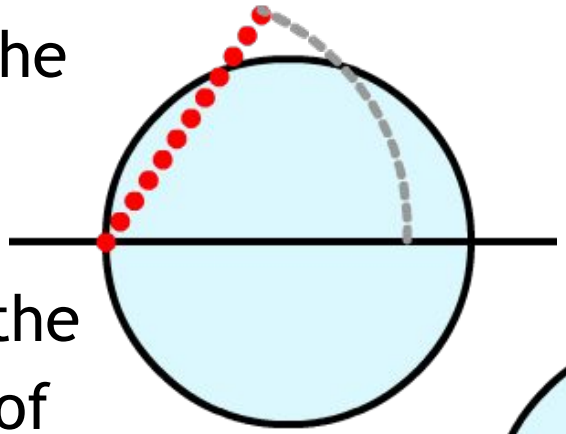


- Use the straightedge to draw a straight, horizontal line through the center of the circle and extending beyond the edges of the circle.

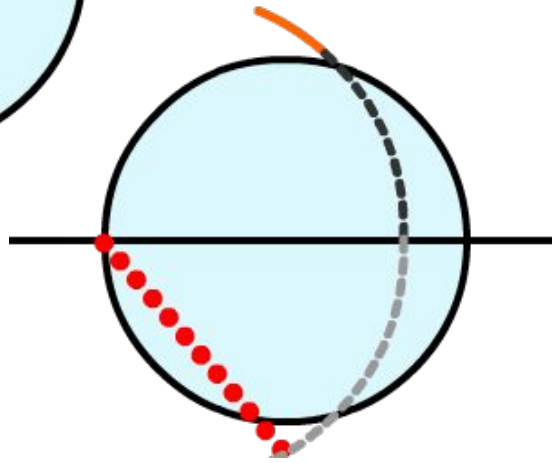


- Place the metal point of the compass on one intersection of the straight line and the circle. Open the compass, so that the distance is greater than three quarters of the way across the circle.



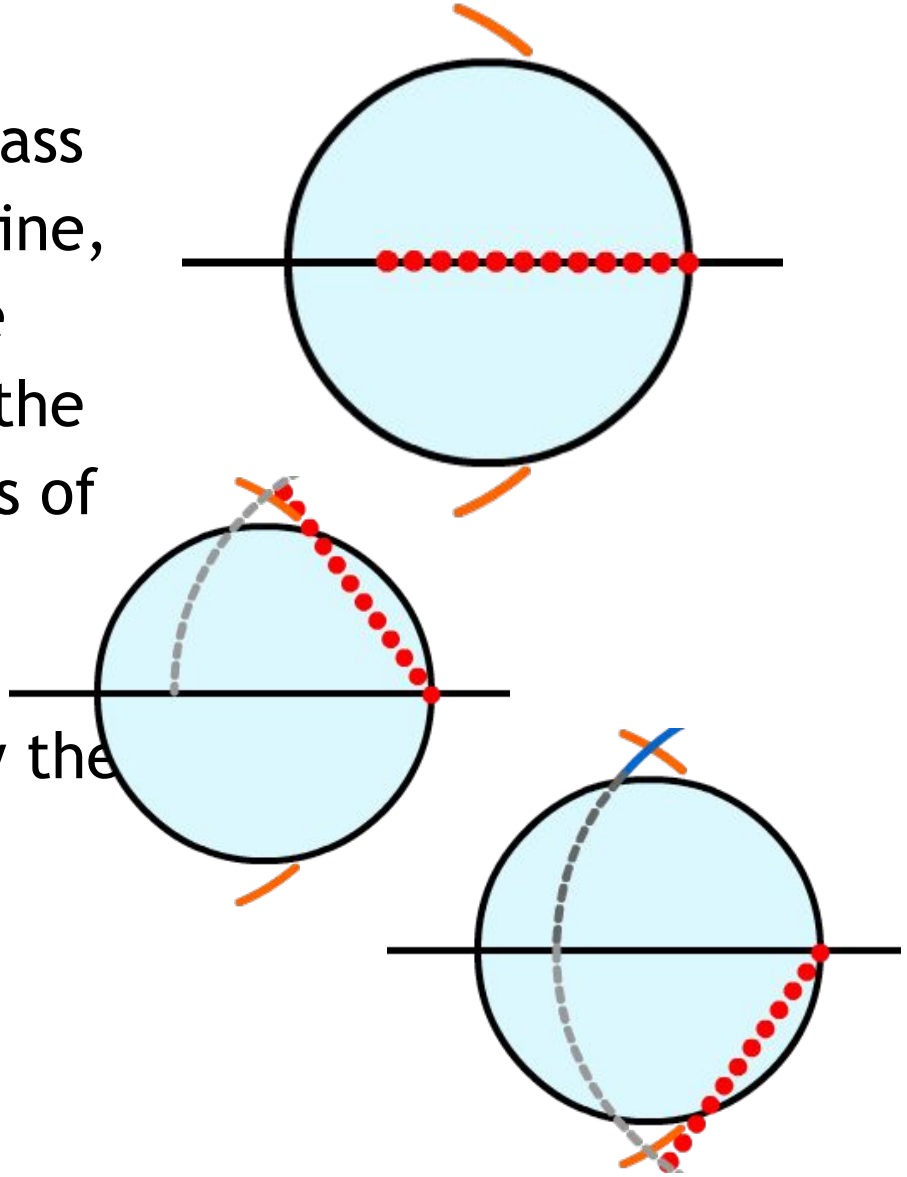


- Keeping the metal point of the compass on an intersection of the circle and straight line, swing arcs above and below the center of the circle



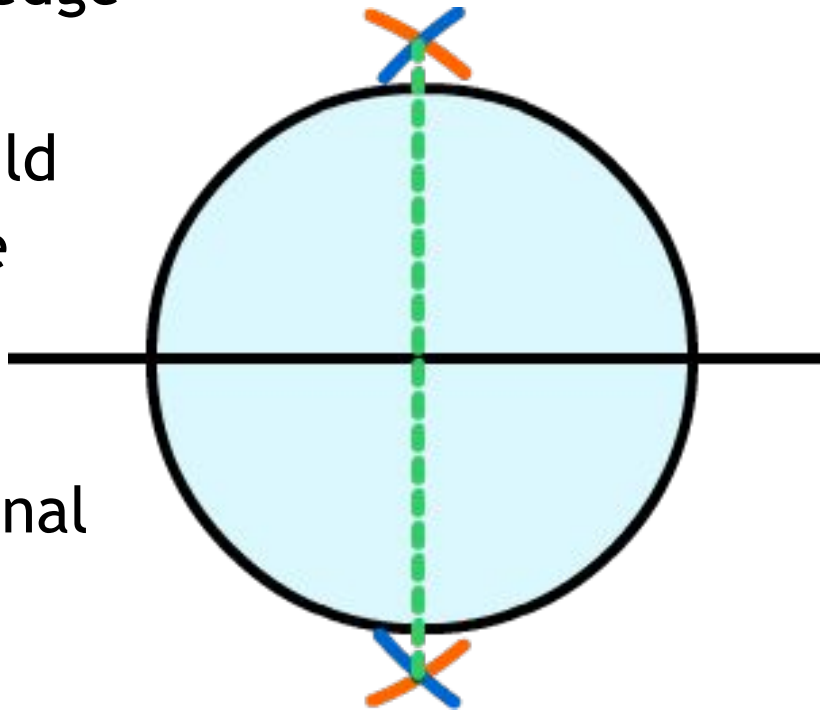
- Move the point of the compass to the opposite end of the line, where it intersects with the outside of the circle. Keep the distance between the points of the compass the same.

- Swing arcs above and below the center of the circle so that they intersect with the previous set of arcs.

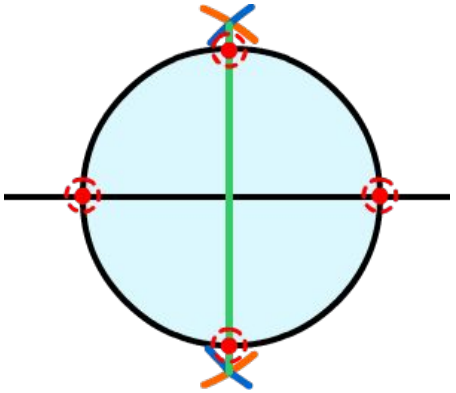


- The intersecting arcs should create two points. Use your straight edge and a pencil to connect those points. The resulting line should pass through the center of the circle.

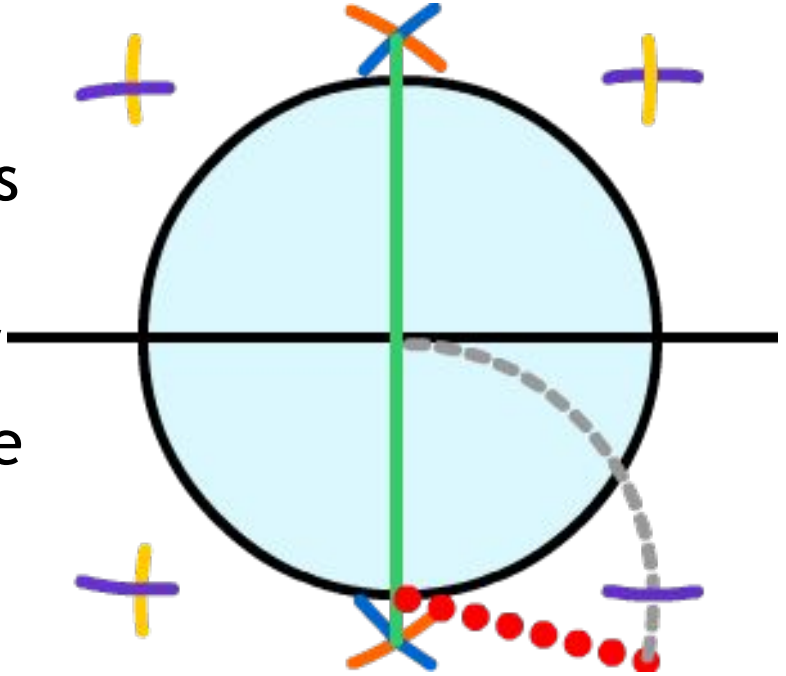
- Close the compass to the original distance you used to draw the circle.



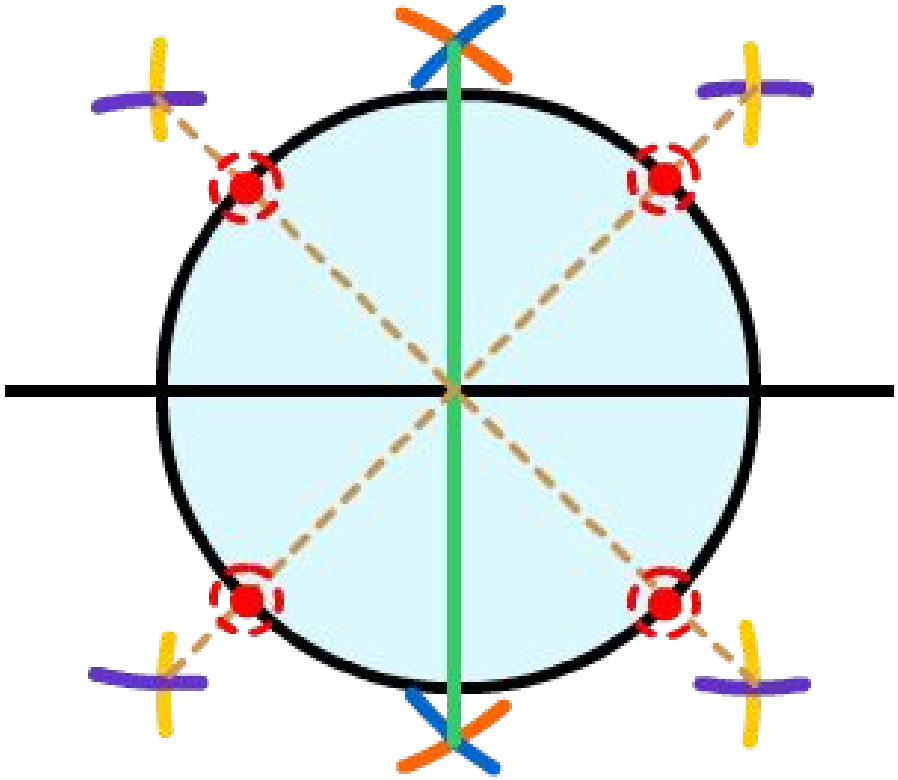
- There are now four places where straight lines intersect the outside of the circle.



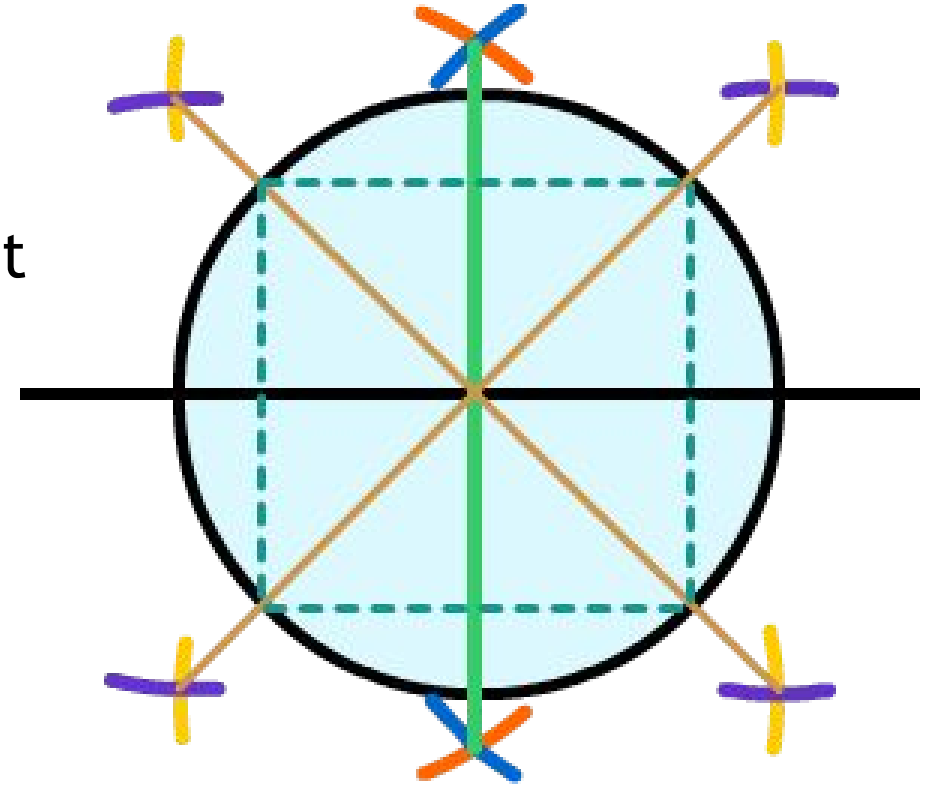
- Place the metal point of the compass on each of those points and swing arcs to the left and right of those points, outside of the circle. Four points should be created from the intersecting arcs.



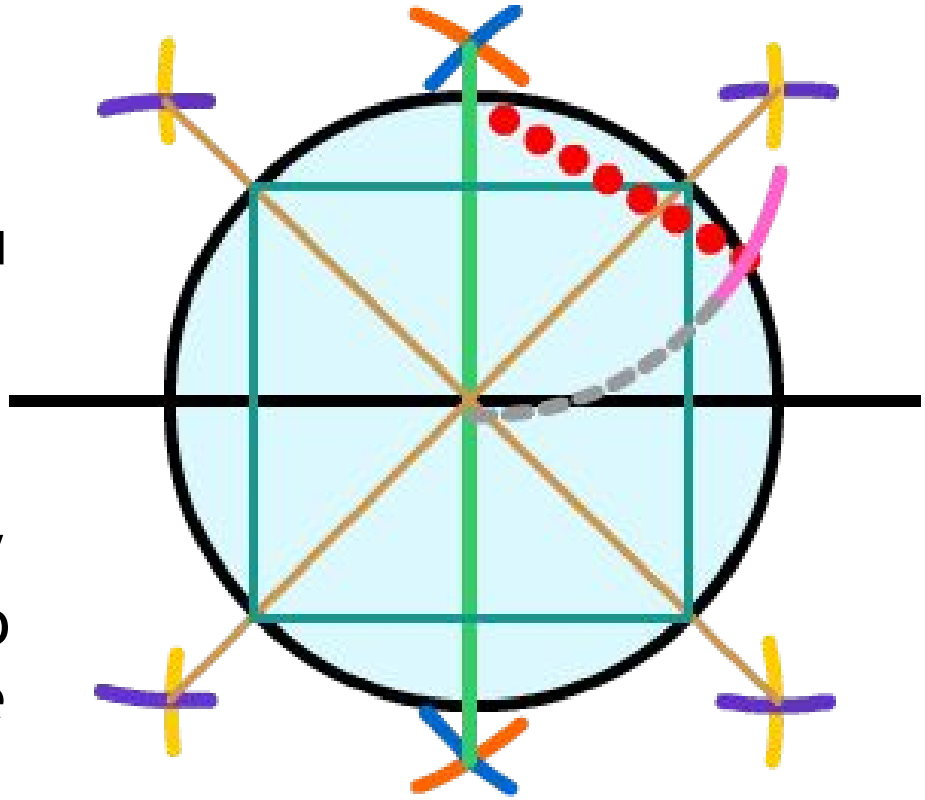
- Draw lines from these points through the center of the circle.
- Locate where these latest lines cross the outside of the circle.



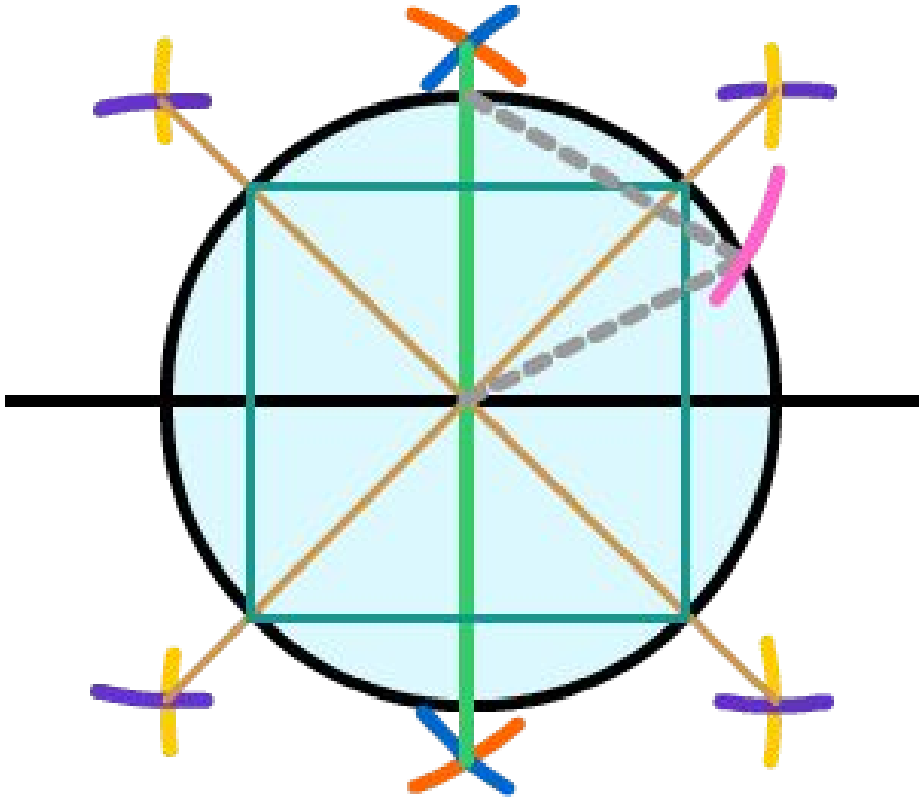
- Starting with the upper right point, using the straightedge, connect that point to the point on the upper left. Connect that point to the lower left point. Connect the lower left point to the lower right point. Connect the lower right point to the upper right point.



- Next, take the compass and put the metal point where the second line you drew crosses the top of the circle. Make sure the compass is set to the distance you used to draw the circle. Swing an arc to the right, so it crosses the outside of the circle.



- Using the straightedge, draw lines from the resulting point back to:
  - The point where you had placed the metal point of the compass, and
  - The center of the circle.



Congratulations!

You've drawn the Magic Circle.

Do it enough times, so that you can do it quickly and are comfortable.