Take a look in the image you want to georeference. It will give the information of the coordinate system that you will have to set up your coordinate system.

Open ArcGIS. Right-click of the mouse over LAYER.

Go in Coordinate System Tab. Select: Projected -> UTM -> WGS84 -> Northern Hemisphere-> WGS84 UTM 17N. Click ok.
Add the georeferencing tool. Customize -> toolbar -> georreferencing.
REMEMBER:

Two basic rules of geo-referencing at the moment. Since we are working on GIS software, we need at least 4 control points. The first will give a position to the image, the second will rotate, the third will give the scale factor and the fourth will calculate the error.

The first two should be diagonal. If the first is in the upper left corner, the second is in the lower right corner.

The control points should preferably be in the edges of the image so that the whole image is adjusted properly and without too many distortions.

Zoom in the upper left corner of the image in order to see the intersection of the pair of coordinates.

Select the ADD CONTROL POINTS in the Georeferencing tool.
In the intersection, left-click in the mouse to create a pin and then right-click. Select Input XY Coordinates.

Enter the correct coordinates.
The map will disappear. Click in the full extent to see it again.
Now zoom the right lower corner.

Select the ADD CONTROL POINTS tool, right-click of the mouse to create a pin, left-click of the mouse and input X and Y...
Add the correct number for the pair of coordinates.

Repeat the procedure to add control points to the next two corners.
After adding the 4 points, click in the tool VIEW LINK TABLE to have more information about this procedure.
In this window, there are two important things to decide about:

First: we have to decide which transformation we are going to use. Use the first-order or affine transformation to shift, scale, and rotate to raster dataset. The higher the transformation order, the more complex the distortion that can be corrected. However, transformations higher than third order are rarely needed. Higher-order transformations require more links and, thus, will involve progressively more processing time. In general, if your raster dataset needs to be stretched, scaled, and rotated, use the first-order transformation. If, however, the raster dataset must be bent or curved, use the second- or third-order transformation.

Second: is the error good enough to go ahead? It is agreed that every map have unavoidable errors. Considering this, the best map considering the unavoidable errors (Map quality pattern A) has an error of up to two tenths millimeters of the scale of the map. That is, if the source map has the scale of 1: 10,000m, you can have up to 2 meters error, i.e.,

\[
\frac{1}{10,000} \\
1\text{mm} = 10000\text{mm} \\
0.2\text{mm} = x \\
X = 2000\text{mm} \\
X = 2\text{m}
\]

To finish this, you have two options: Update and retify. Update you overlap the file and retify you create another file storing the georeferencing information.

If you use retify, remember to choose a type of extension that can store coordinate information, i.e., geotiff and img are the most common but you can choose jpg2000, sid, grib.
Add the image TIFF that you created.
To see if the georeferencing is ok, add the basemap.