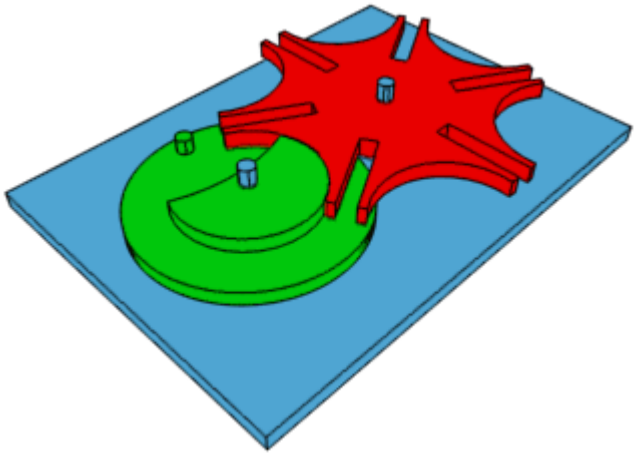
ME 231 SW Exam Summer 2021



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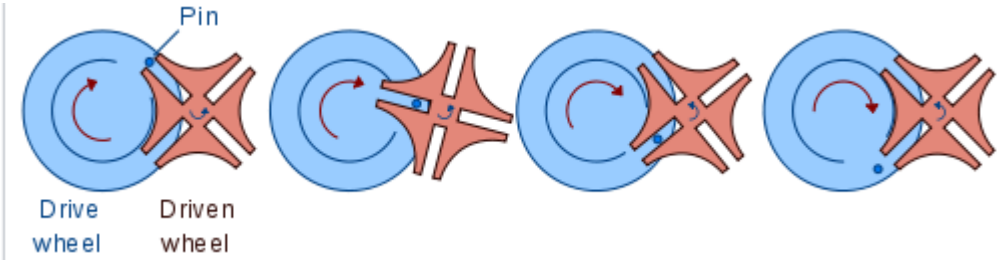
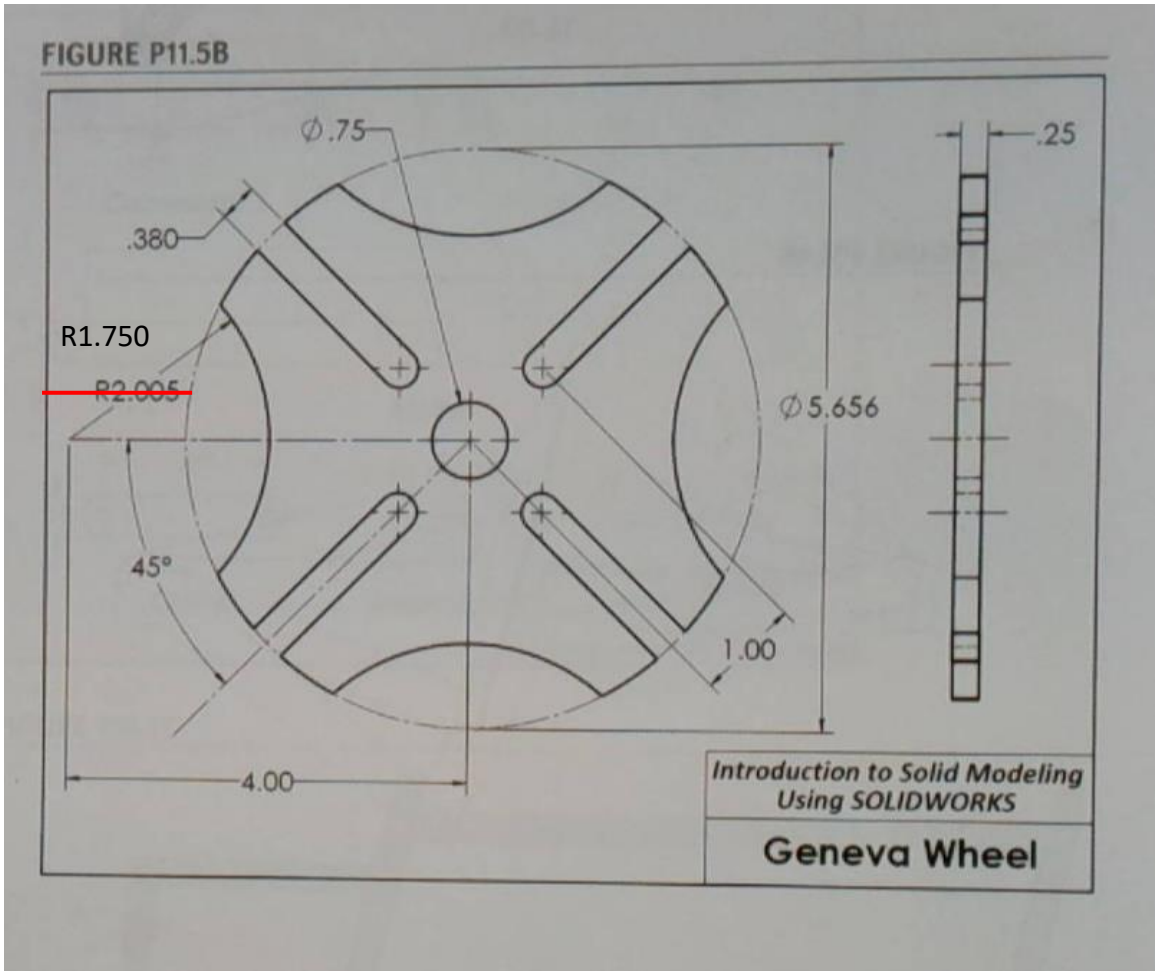
1. A basic Geneva Wheel assembly is illustrated here:



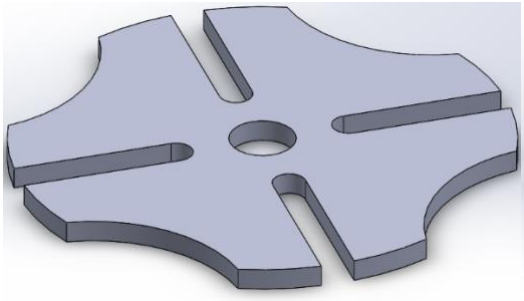
This mechanism translates a continuous rotation movement into intermittent rotary motion. For the mechanism shown above, the driven wheel has four slots. A pin on the drive wheel will advance the driven wheel by 90° for each full rotation of the drive wheel. If the driven wheel has *n* slots, it advances by 360°/*n* per full rotation of the drive wheel. You will model the driven wheel part of the assembly only. Create your part model so that the part can easily be revised to a wheel having n= 2, 3, 4, 5, or 6 slots. Create one global variable "n" so you can revise that value in one location in your file, and the model will be correct when it rebuilds.

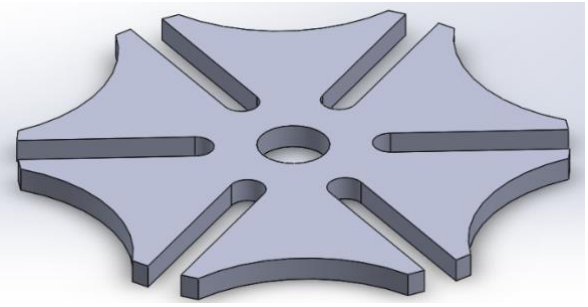
Model the Geneva Wheel based on the drawing shown in FIGURE P11.5B:



Set up your file so the units are inches. Note that one dimension on the drawing needs to be revised, as shown.

For reference, here are actual trimetric views of a 4 slot and 6 slot Geneva drive wheel based on the drawing above with the revised dimension value.





The material for the part is POM Acetal Copolymer. Create sensors to measure the volume and mass of the part. For each part configuration, complete the following table by entering mass and volume of the drive wheel. Enter answers in the nearest ten thousandth (4 decimal places) of a unit.:

Geneva Drive Wheel POM Acetal Copolymer		
n slots in drive	Mass (pounds)	Volume (in^3)
2	0.2589	5.1558
3	0.2334	4.6482
4	0.2079	4.1407
5	0.1824	3.6332
6	0.1570	3.1256

2. Create a fully dimensioned drawing in SW of the part on ANSI A size paper in landscape orientation. Add a simple border/title block. Your drawing should be created with the n=4 slots and it should look very similar to the FIGURE P11.5B drawing provided. The title block on your drawing should include a part name, your name, the date, and the scale. Save your drawing as a .pdf

3. Create an eDrawing of the same part (n=4).

4. Create an ePart of the same part (n=4).

Submission:

Upload 4 files. The file naming convention is left to your discretion.