

Learning the Basics of Inventor and CAD

Part 1



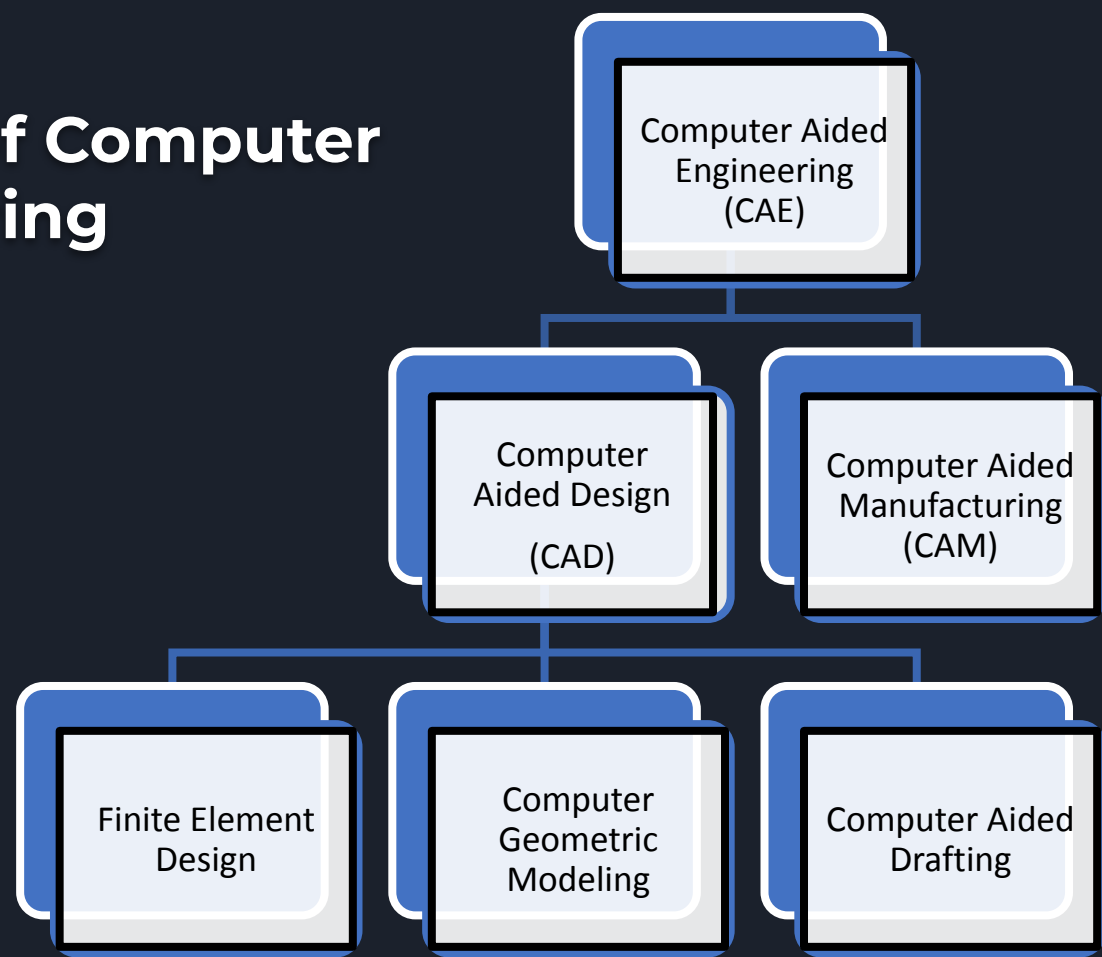
AUTODESK[®]
INVENTOR[®]



5549
GRYPHON ROBOTICS

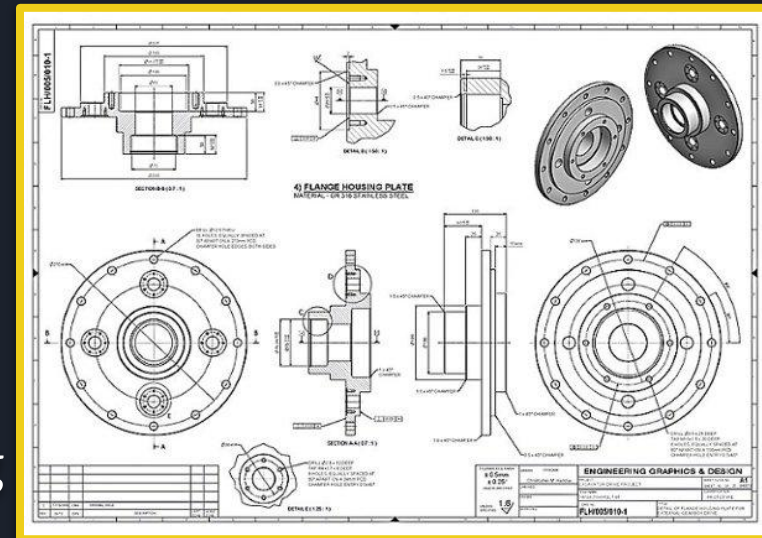


The Branches of Computer Aided Engineering



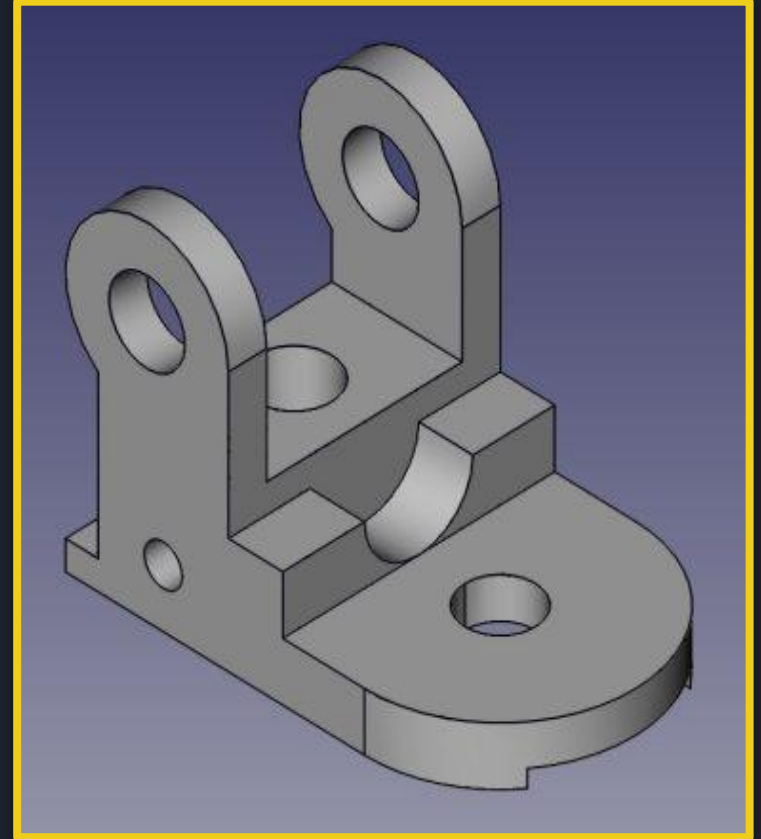
Engineering Drawings

- Engineering drawing
 - Technical in nature
 - Clearly defines requirements
 - Created in accordance with specific standards
- Engineering Graphics or Technical Drawing
 - Technique of creating an engineering drawing for fabrication



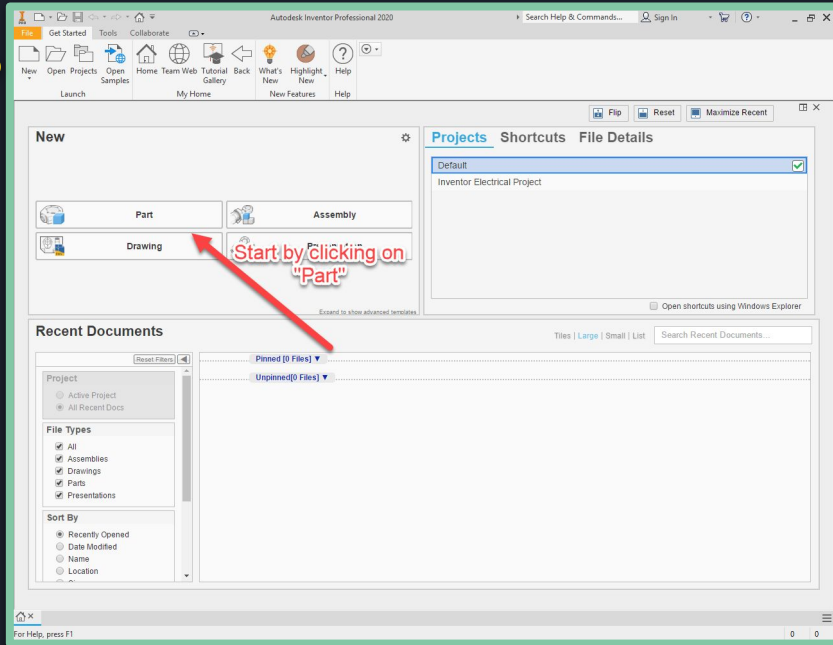
CAD Allows You To...

- Create 3D objects easily
- Identify
 - Volume
 - Mass
- 3D print accurate representations of your designed object

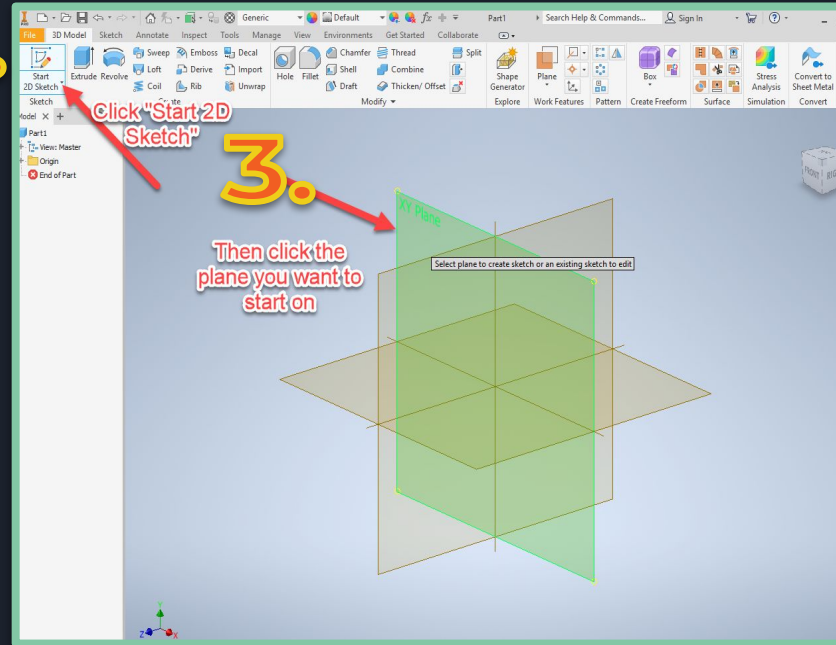


How to Get Started

1.



2.



General Navigation

- Scroll with mouse to zoom in and out
- Hold middle mouse button to freely move
- Use the navigation cube to change orientation of your part

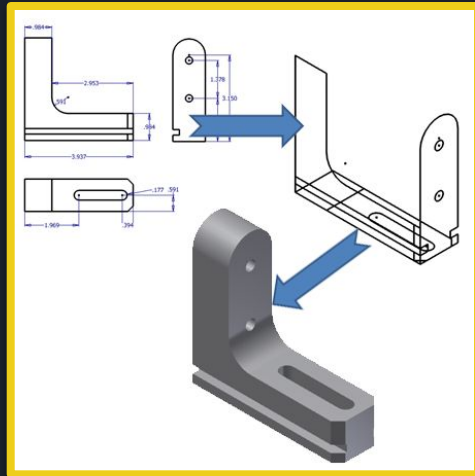


Frequently Used Tools - In Sketch Mode



1. Line, Circle, and Rectangle buttons
 - a. Allows a line/shape to be drawn
2. Arc
 - a. Use to create arcs/curve
3. Dimension Tool
 - a. Allows someone to take dimensions of a shape

The Navigation Bar - In Sketch Mode



“Finish Sketch” to
exit your sketch and
start making it 3D

Frequently Used Tools - Not in Sketch Mode

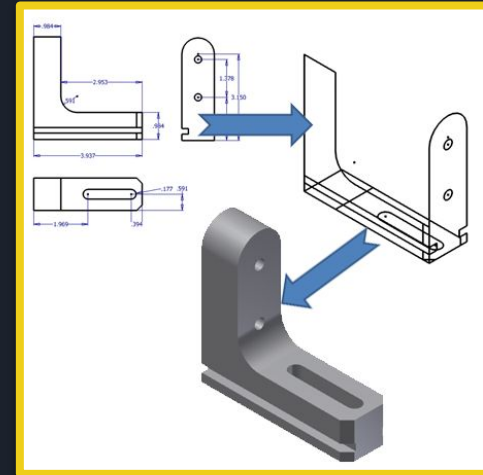


1. Extrude

a. Used to make 2D objects 3D

2. Fillet

a. Used to make sharp/rough edges curved/smooth





Other Important Tips / Tricks

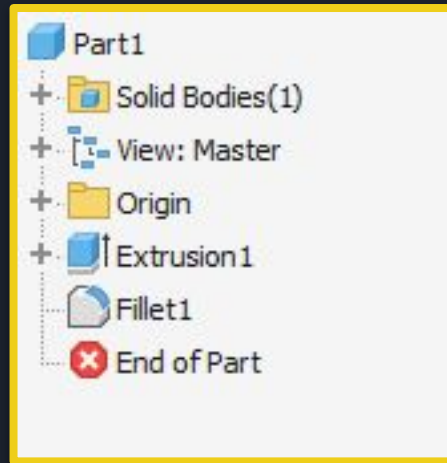
Pressing “Esc” button exits out of the tool you’re using



Pressing “Ctrl + Z” deletes the most recent thing (undo)

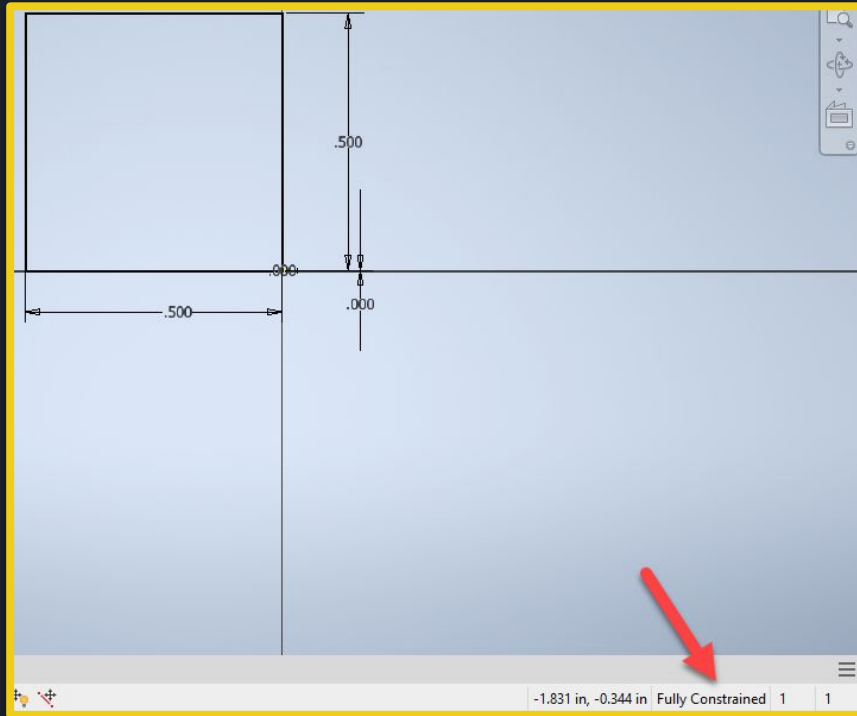
Other Important Tips / Tricks

Navigation Tree



This menu allows you to go back and look at what tools you have used so far

Other Important Tips / Tricks

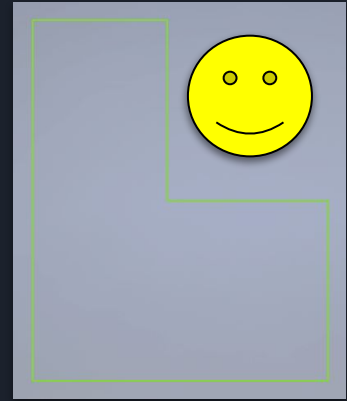
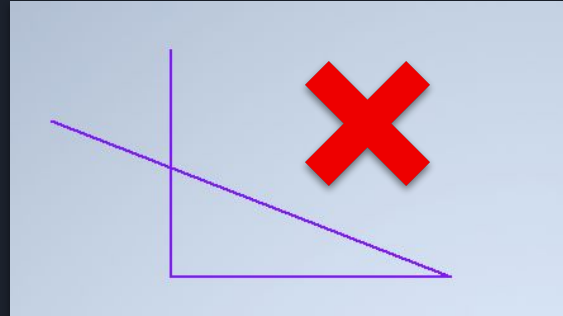


You can tell if something is fully constrained by looking for the “fully constrained” sign and if all your sides have dimensions

Tips For Sketches



"Sketch Guide"

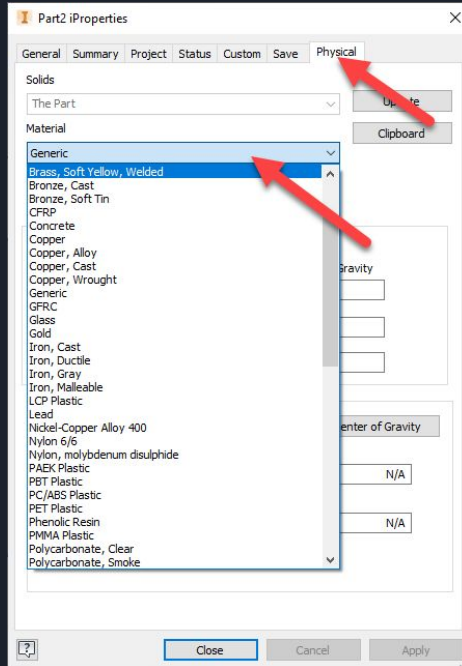
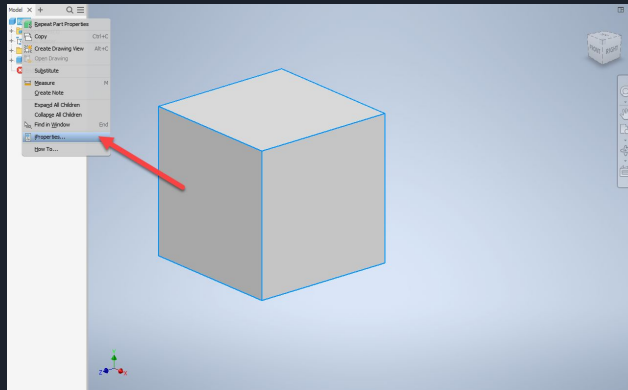


- Create a sketch that is proportional to the desired shape
- Do not overlap lines
- Form a closed region
- Use the "Sketch Guides" to tell what angle your line is at

Finding the Properties of Your Object

Go to the “Physical” tab
and select the material

Right Click on the part in the nav.
Tree and click “IProperties”



Then you get the properties of your
object!

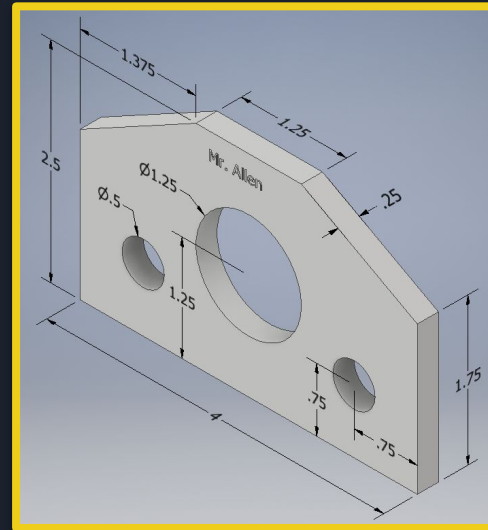
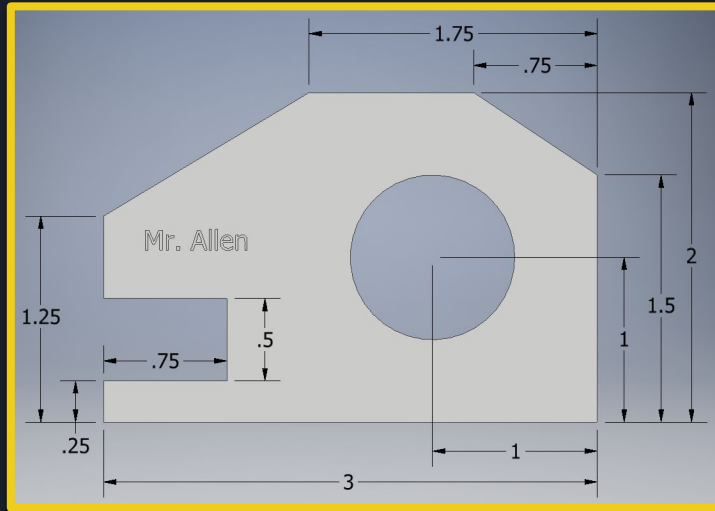
General Properties			
			Center of Gravity
Mass	0.087 lbmass (Relative)	X	-0.250 in (Relative)
Area	1.500 in ² (Relative)	Y	0.250 in (Relative E)
Volume	0.125 in ³ (Relative)	Z	0.250 in (Relative E)



Experience is the best teacher!

The only way to truly get good at Inventor is to **practice and model things in real life!**

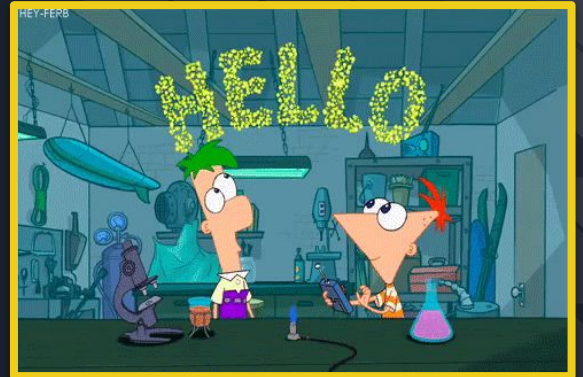
Try Modeling These!



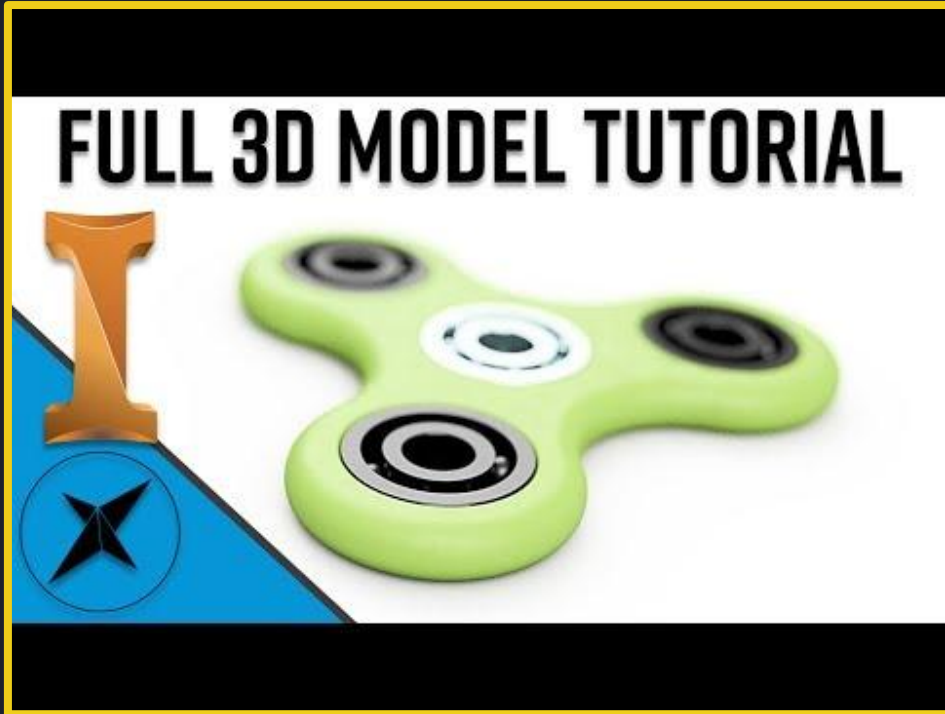
Make the width for both of them .25in

Learning the Basics of Inventor and CAD

Part 2



Designing Fidget Spinners!



You can use this as a step by step instruction video or find another one online!

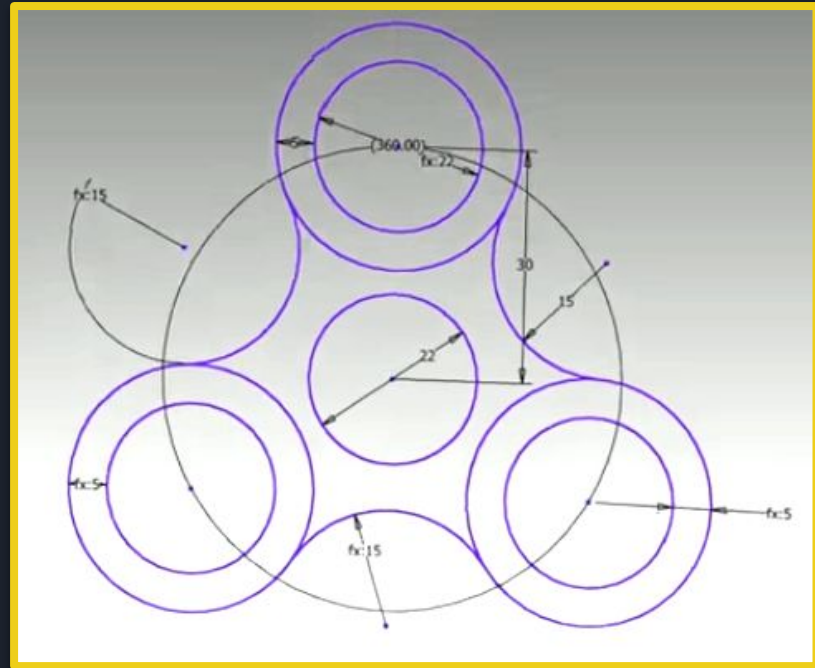
Dimensions for the Fidget Spinner

The inside circles are all **22 mm**

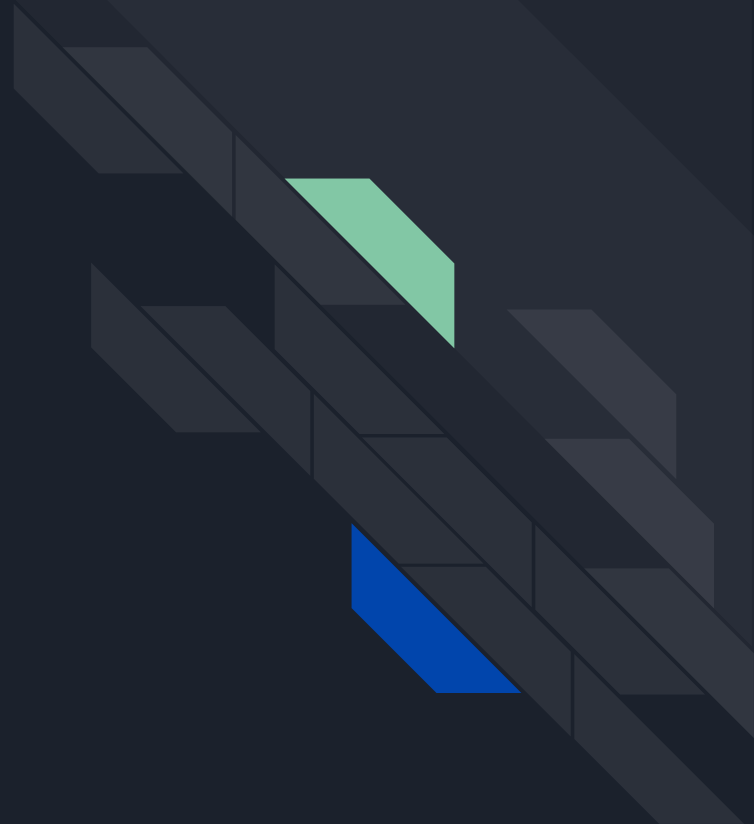
The outside rims are **5 mm** away from the inside circles

The three outside circles are **30 mm** away from the center circle

The arcs are **15 mm** away from their center point

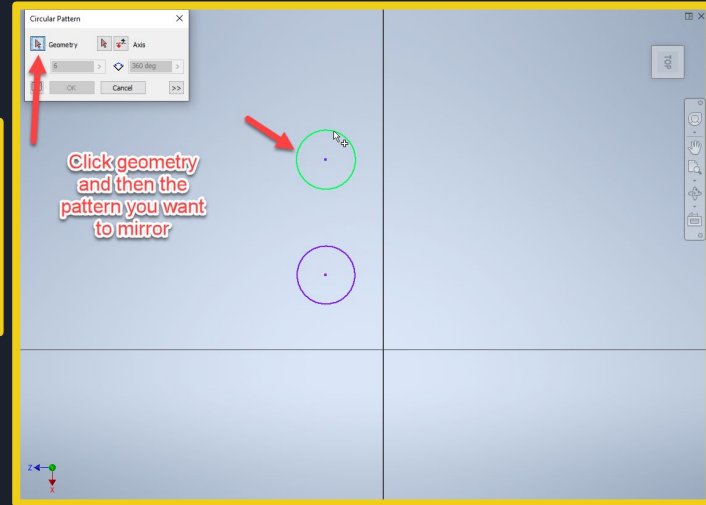
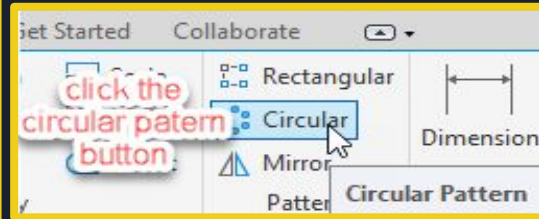
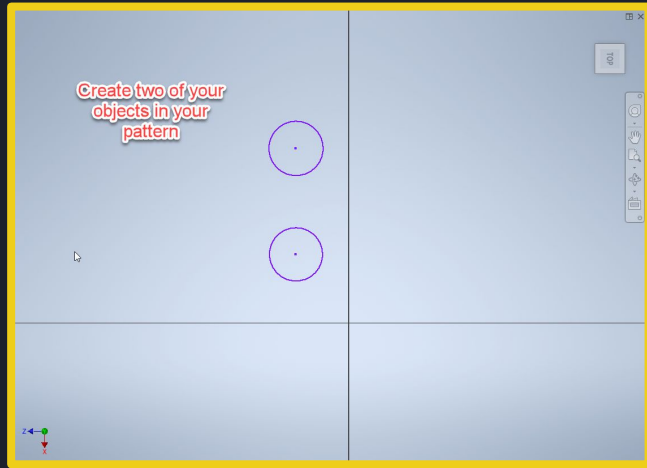


Useful tools

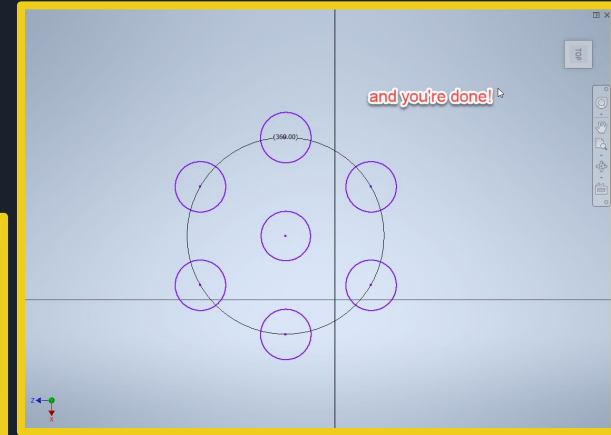
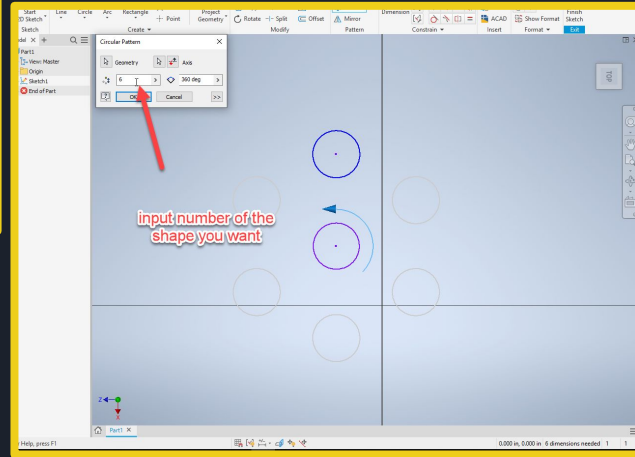
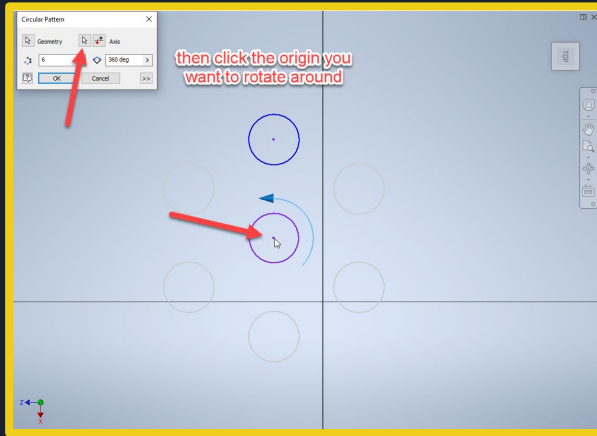


Pattern tool

This allows you to repeat a pattern multiple times.

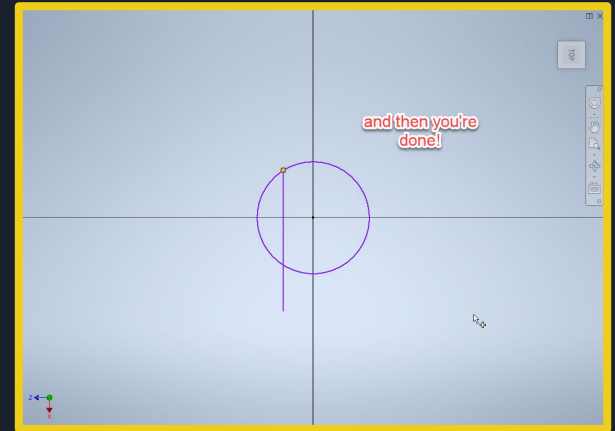
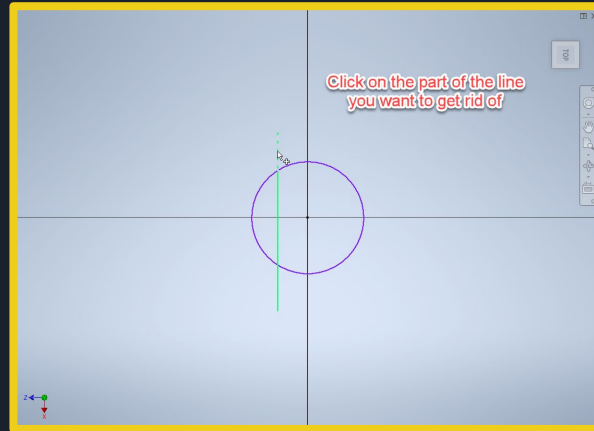
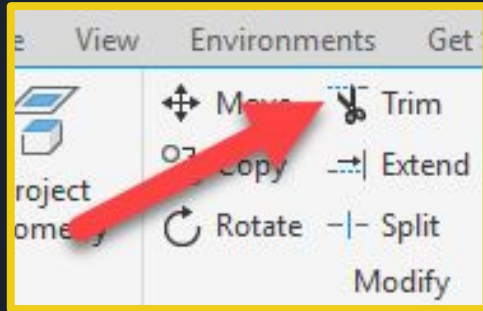


Pattern Tool Continued



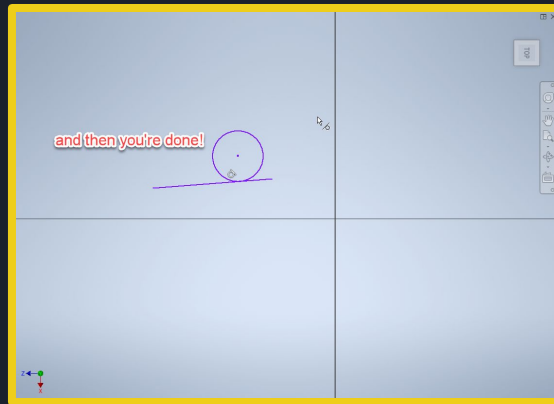
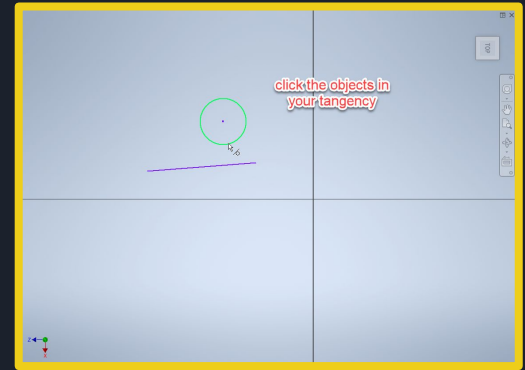
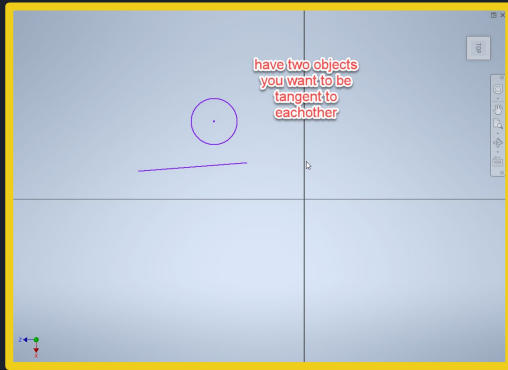
Trim Tool

This allows you to remove parts of an object's shape



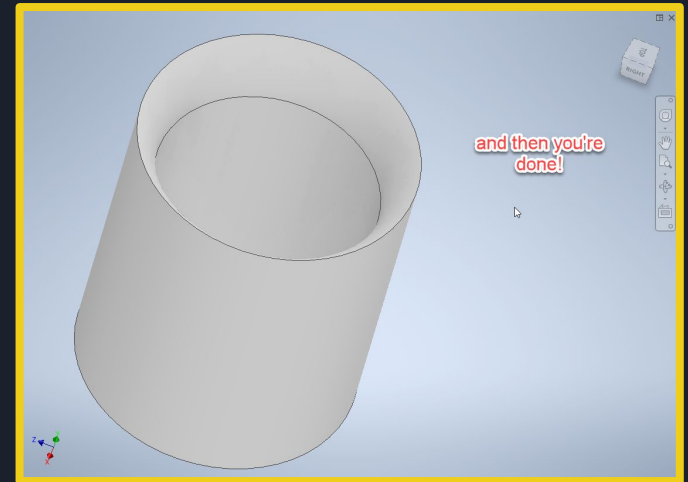
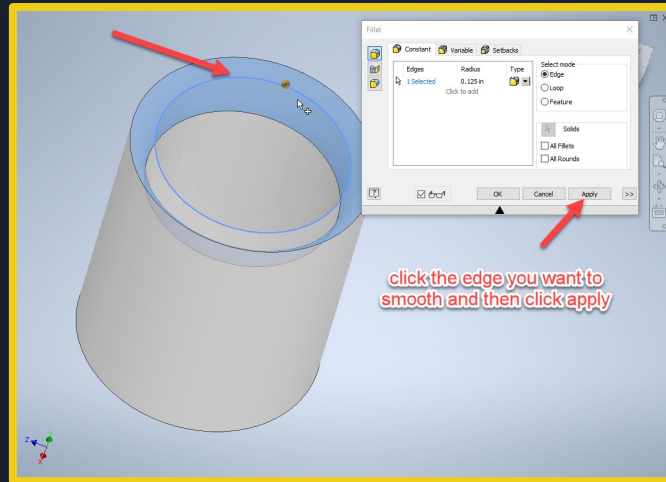
The Tangent Tool

Allows shapes to be flush against each other



Fillet Tool

This allows sharp edges to be smoothed



GRABCAD

Upload your fidget spinner to GrabCAD to save it for later!

