MEASURING THE MECHANICS

Matthew is a Systems Engineer for Metalvionics, a metallurgy research and engineering company that designs components for jet engines. Metalvionics has created a new alloy, called Brunhild, to be used in turbine engines. This alloy will revolutionize the issues surrounding firing temperatures and fuel costs.

Scenario
Matthew is charged with the task of visually presenting the proposed replaceable component of their M Gas Turbine.

Files Used in this Exercise
Metalvionics.zip (Win)

Objectives
After this exercise you will be able to:

- » Change page size
- » Set up guides
- » Draw a circle, a rectangle, and a line using the Properties bar
- » Replicate an objectChange fill ink to nil
- » Combine multiple objects
- » Add labeled dimensions to an object
- » Annotate an object

Required knowledge to perform this exercise:

- » Open a file and change file types
- » Save a file
- » Use the Undo command
- » Move an object
- » Recognize rulers
- » Recognize the Properties bar
- » Understand opacity
- » Understand guides

If at any time your document is not in the middle of the window, press SHIFT+F3 (Windows).

Narrative of this exercise
For this exercise, use the files found in the **Metalvionics file (Win)**.

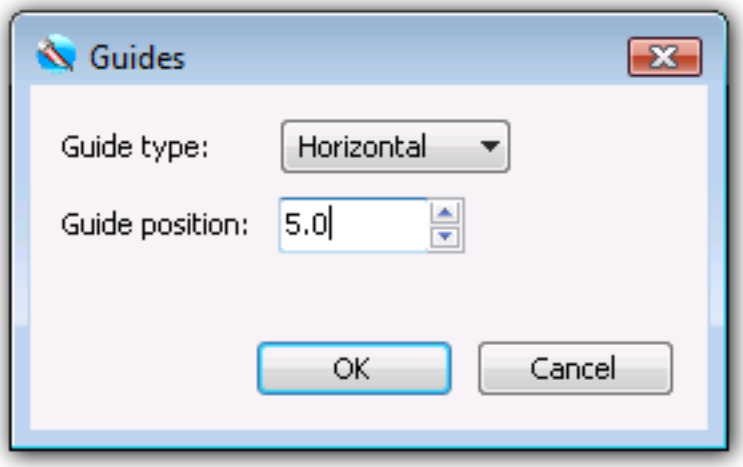
Begin by launching Canvas; notice that the Startup dialog ap-pears. Select an Illustration document. Pull out a guide from both the horizontal and vertical axes. Change the guides to be 5.5" and 8.5." respectively. Change fill ink to null. Draw a 3" circle where X=1 and Y=5. Use left-of-center as a reference point. Replicate the circle and change the new circle to be 3.5" at X=0.75 and Y= 5.5. Create a 0.25" x 1.25" rectangle at X=0.625 and Y=5.5". Com-bine the rectangle and 3.5" circle. Create a 1" circle at X=8 and Y=5.5. Replicate the circle and change the new circle to be 1.5" at X=7.75 and Y= 1.5. Create a line with the following properties: Start X=3.000 and Y=3.825; End X=8.500 and End Y=4.750. The Length=5.750 and Angle=99.500. Create another line with the following properties: Start X=3.100 and Y=7.150; End X=8.500 and End Y=6.250. The Length=5.750 and Angle=80.575. Add a labeled dimension for the smallest circle. Annotate the combined object to read Replace with Brunhild. Save the file as **rod.cvx.**

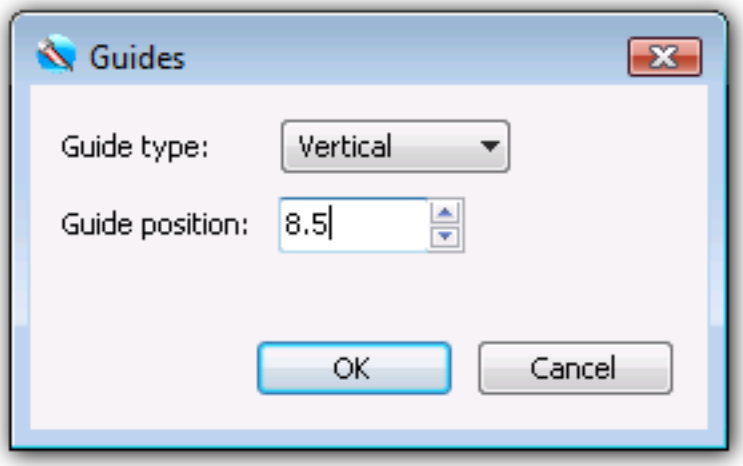
Files used in this exercise

A sample end result to this exercise can be found in the Metalvionics file: answer_rod.cvx

STEP 1: CHANGE PAGE SIZE; SET UP GUIDES

1) Launch Canvas. Select an Illustration document.
2) When the layout area appears, open the Paper menu in the Properties bar and select Tabloid. The document size should change to 11x17.
3) Hold your mouse pointer over the horizontal ruler. The mouse pointer becomes a double-headed arrow.
4) Drag and drop a guide from the ruler into the document area.
5) Double-click the guide. The Guides dialog box appears.
6) Change the Guide position to **5.5** and click OK. A horizontal guide appears.
7) Hold your mouse pointer over the vertical ruler. The mouse pointer becomes a double-headed arrow.
8) Drag and drop a guide from the ruler into the document area.
9) Double-click the guide. The Guides dialog box appears.
10) Change the Guide position to **8.5** and click OK. A vertical guide appears.





STEP 2: USE THE OVAL TOOL AND PROPERTIES BAR TO CREATE A CIRCLE

1) Click the Fill Ink icon in the Toolbox The Presets palette opens. Click to set the fill ink to null.
2) Select the Oval tool or press O. The pointer becomes a crosshair.
3) In the Properties bar, type the following:

X=1.000 =3.000 Y=5.500 =3.000

4) Choose the left-of-center.
5) Click Create. A circle appears.

STEP 3: REPLICATE, RESIZE, AND REPOSITION A CIRCLE

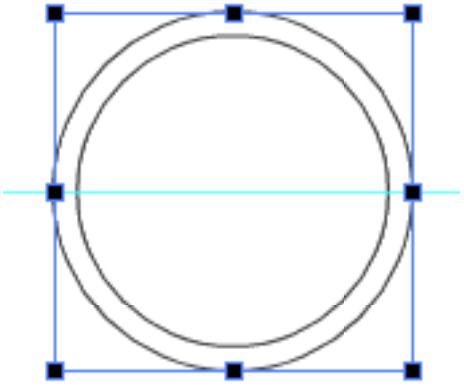
1) Choose Edit > Replicate. The Replicate dialog box appears.
2) Click OK. A second circle appears directly on top of the original.
3) In the Properties bar, type the following:

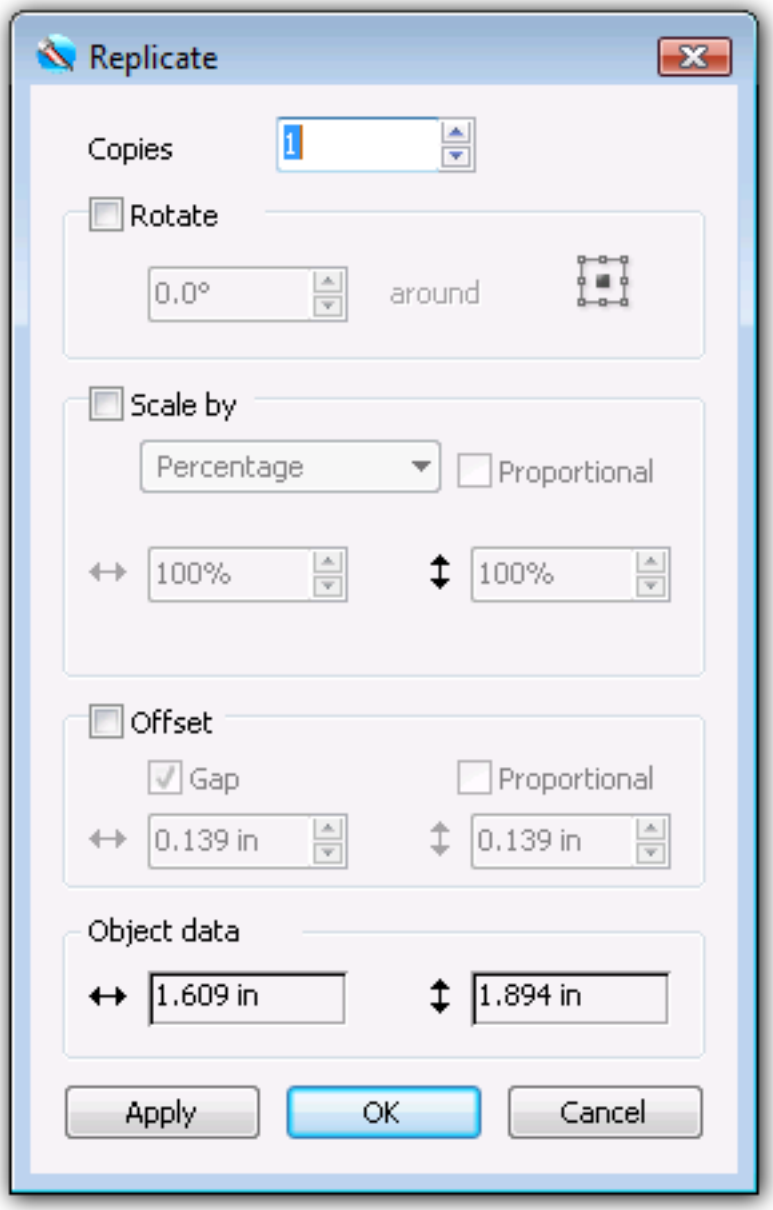
X=0.750 =3.500

Y=5.500 =3.500

The circle is resized and repositioned.

4) Press Esc twice. The circle is deselected. Here is what your project looks like so far.





STEP 4: USE THE RECTANGLE TOOL AND PROPERTIES BAR TO CREATE A RECTANGLE

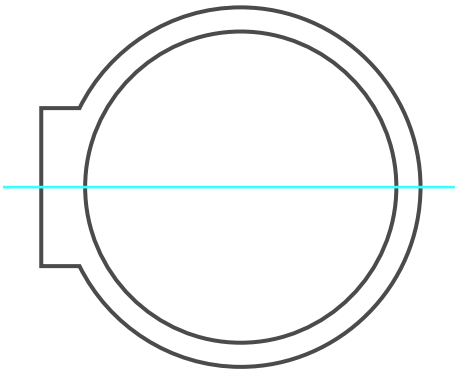
1) Select the Rectangle tool or press R. The pointer becomes a crosshair.
2) In the Properties bar, type the following:

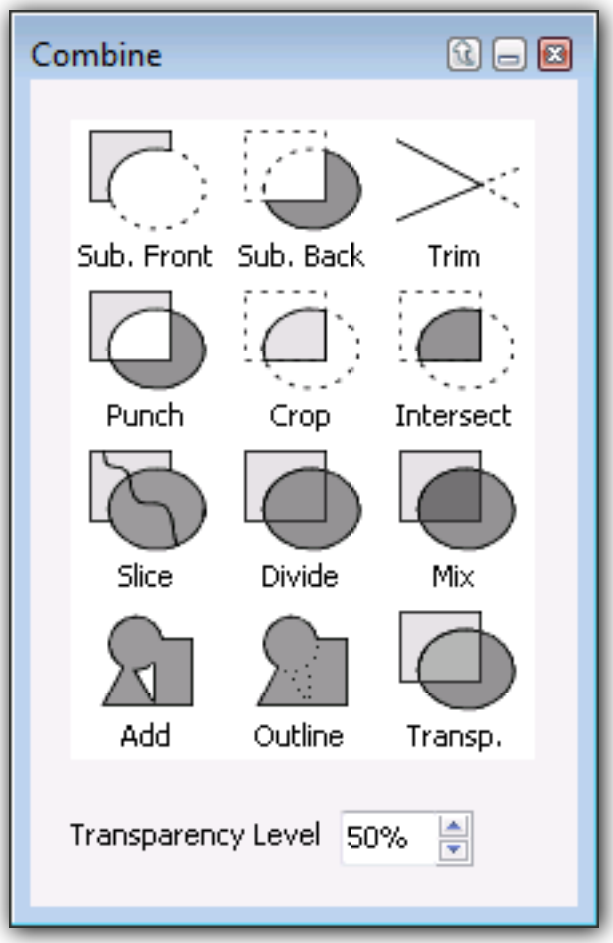
X=0.625 =0.250 Y=5.500 =1.250

3) Click Create. A rectangle appears.

STEP 5: COMBINE TWO OBJECTS

1) Shift+click the outermost circle. A circle and the rectangle are both selected.
2) Choose Effects > Combine to open the Combine palette. The Combine effects are also available in the Properties bar.
3) Click Add. The rectangle and circle have formed a new object. Close the Combine palette.
4) Press Esc. The object is deselected. Here is what your project looks like so far.





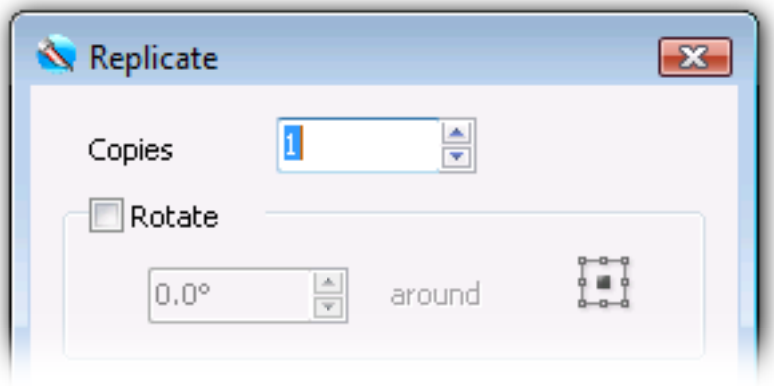
STEP 6: USE THE OVAL TOOL AND PROPERTIES BAR TO CREATE A CIRCLE

1) Select the Rectangle tool or press R. The pointer becomes a crosshair.
2) In the Properties bar, type the following:

X=8.000 =1.000 Y=5.500 =1.000

3) Click Create. A circle appears.

STEP 7: REPLICATE, RESIZE, AND REPOSITION A CIRCLE



1) Choose Edit > Replicate. The Replicate dialog box appears.
2) Click OK. A second circle appears directly on top of the original.
3) In the Properties bar, type the following:

X=7.750 =1.500
Y=5.500 =1.500

The circle is resized and repositioned.

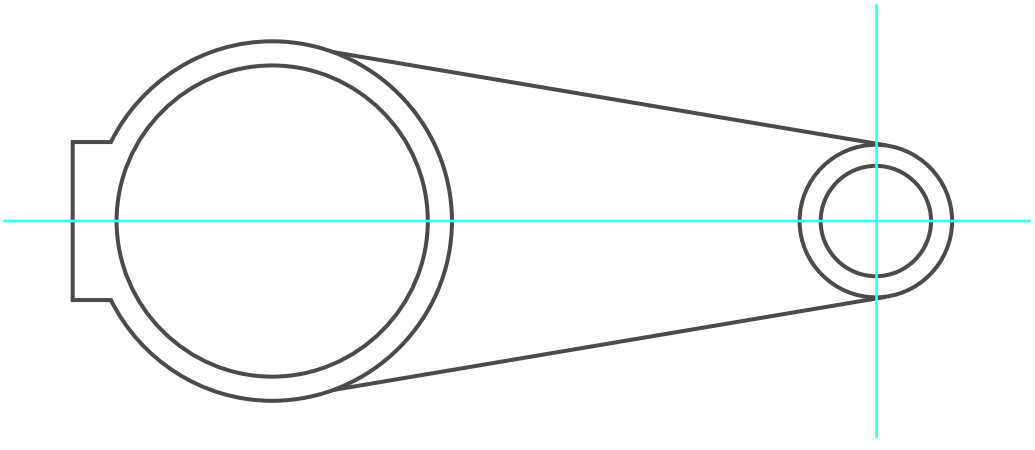
4) Press Esc twice. The circle is deselected.

STEP 8: USE THE LINE TOOL AND PROPERTIES BAR TO CREATE LINES

1) Select the Line tool or press L. The pointer becomes a crosshair.
2) In the Properties bar, type the following:
   Start X=3.000 End X=8.500 Length=5.750
   Start Y=3.825 End Y=4.750 Angle=99.500

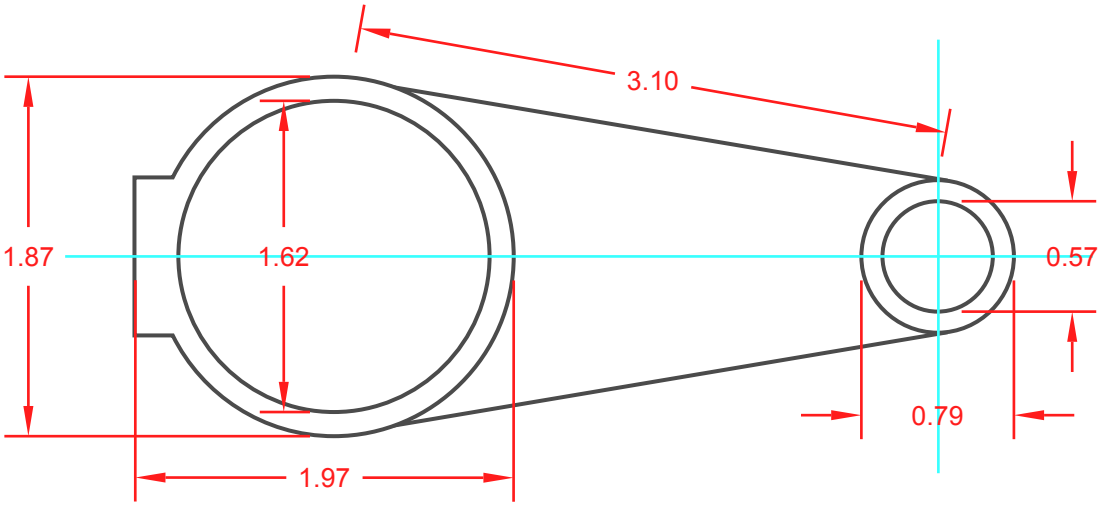
3) Click Create. A line appears.
4) Press Esc twice. The line is deselected.
5) Select the Line tool or press L. The pointer becomes a crosshair.
6) In the Properties bar, type the following:
   Start X=3.100 End X=8.500 Length=5.750
   Start Y=7.150 End Y=6.250 Angle=80.575

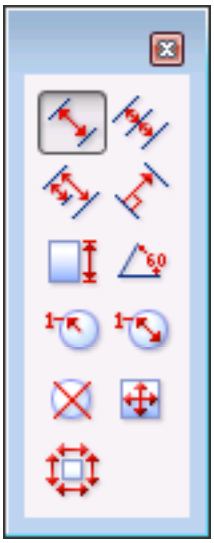
7) Click Create. A line appears.
8) Press Esc twice. The line is deselected. Here is a sample of what your project looks like so far.



STEP 9: ADD OBJECT DIMENSIONS AS LABELS

1) Select the Linear Dimensioning tool . The pointer becomes a crosshair with the prompt Click 1st Point.
2) Click the inside center edge of the smallest circle. The prompt Click 2nd Point appears.
3) Click the opposite edge. The dimensioning lines appear.
4) Move the pointer below the circle in an empty area and click. The circle's dimensions appear.





STEP 10: ANNOTATE AN OBJECT

1) Select the Annotations Notes - Basic tool . The words Click Object appear.
2) Click the Combined object. The words Place Annotation appear.
3) Click in an empty area away from the object and type Replace with Brunhild.
4) Save the document as rod.cvx.