

Concept: Constructions

Name:

COMPUTER COMPONENT

Instructions: In UMATH X™ follow the **Content Menu** path:

Measurement and Geometry > Constructions



Work through all Sub Lessons of the following Lessons **in order**:

- *In This Topic*
- *Perpendicular Bisector*
- *Circumcircle of a triangle*
- *Centroid of a triangle*
- *Bisector of an angle*
- *Incircle*
- *Perpendicular from Point on Line*
- *Perpendicular from Point off Line*
- *Orthocenter*



As you work through the computer exercises, you will be prompted to make notes in your notebook/math journal.

SUMMARY

1. For the following chart, you will be asked to create a series of constructions. Accuracy and care are key elements:

- ▷ Ruler
- ▷ Compass
- ▷ A sharp pencil
- ▷ Eraser

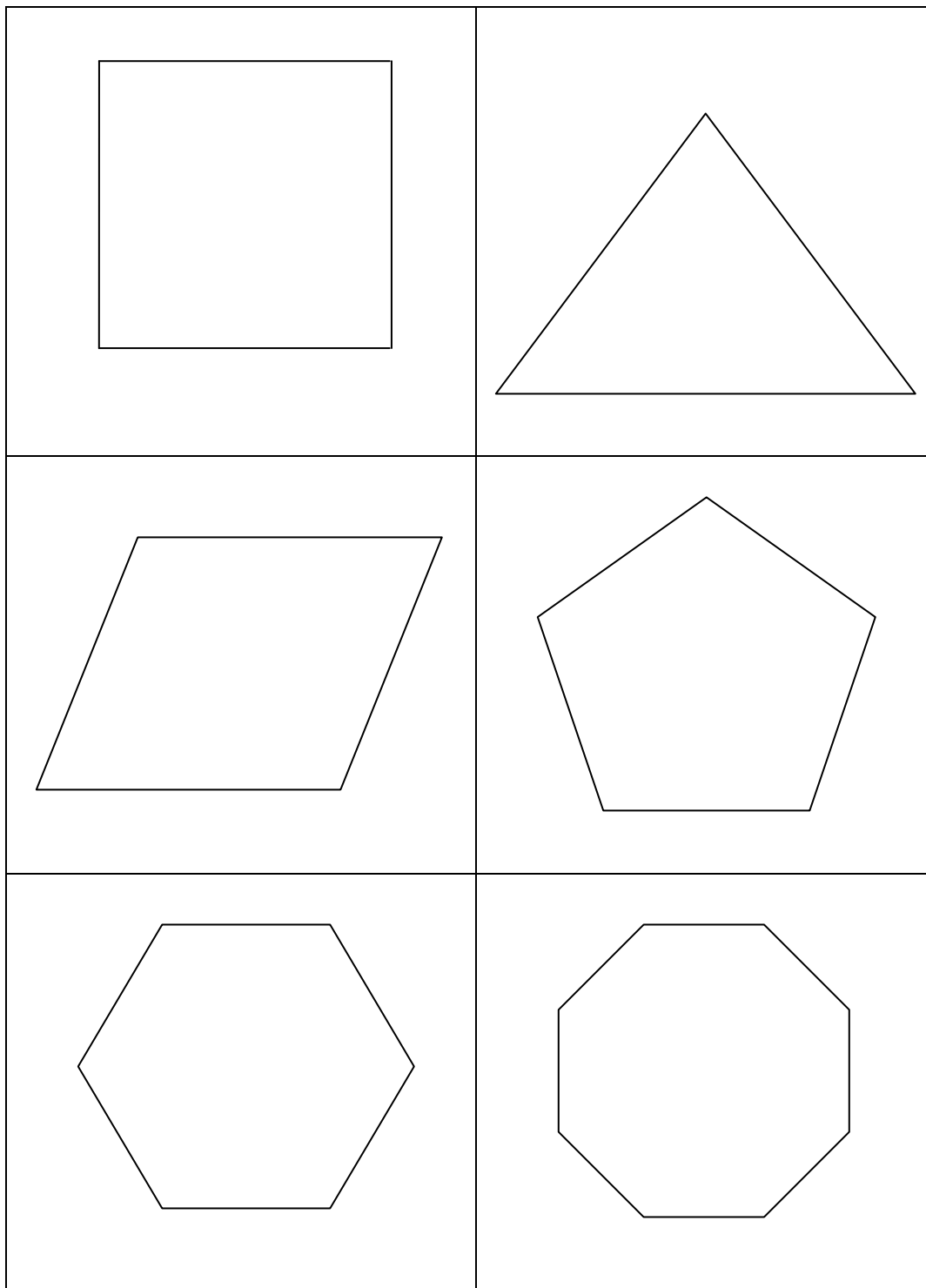
You will be prompted throughout this series of lessons to ‘try’ these concepts on your own...space in the chart has been allocated for each construction.

NOTE: Please do not erase any of the actual arcs that you make with the pencil and compass as this illustrates the process that you used.

<p style="text-align: center;">Perpendicular Bisector</p>	<p style="text-align: center;">Circumcircle</p>
<p style="text-align: center;">Centroid</p>	<p style="text-align: center;">Angle Bisection</p>
<p style="text-align: center;">Incircle</p>	<p style="text-align: center;">Perpendicular (From a point ON the Line)</p>
<p style="text-align: center;">Perpendicular (From a point OFF the Line)</p>	<p style="text-align: center;">Orthocenter</p>

OFF COMPUTER EXERCISES

1. Bisect the interior angles in each of the following polygons. Look for patterns and shortcuts for this task and record your observations in the space below the chart.



Observation: *Regular polygons that have an even number of congruent sides, can demonstrate bisected sides simply by joining the opposite vertices. An uneven number of sides will bisect the opposite side passing through a common point in the central region of the polygon.*

2. In the space provided, draw a circle and then carry out these steps:

- Keep the same radius used to draw the circle, for this entire exercise.
- Select a point on the circle's circumference.
- Use the compass to draw an arc that passes through the center of the circle and intersects the circumference in two places.
- Working in a clock-wise direction, use this new intersection point and draw a second arc that passes from edge to edge, passing through the center.
- Continue around the circle to complete the pattern.
- Shade in every second region.
- Repeat the experiment setting sizes $>$ the radius and / or $<$ the radius.

3. In the question above, you probably noticed that the pattern created the six points that could be used to draw a hexagon inside the circle. Here's the challenge

- Draw a series of circles on the back of this sheet and then construct the following regular polygons on the OUTSIDE of the circles: square, hexagon, octagon (and if you're really a whiz, try to construct a regular pentagon).

- 4) Your federal government has commissioned you to design a new coin with a value of \$5.00. It will take the design of a dodecagon (12 sides) and the finished coin will be 3 cm from edge to edge. In the space below, make a technical drawing of the coin scaled up (3:1).