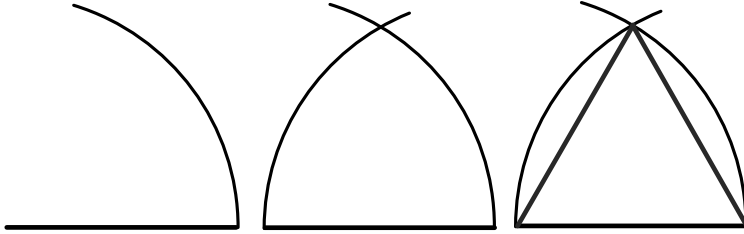


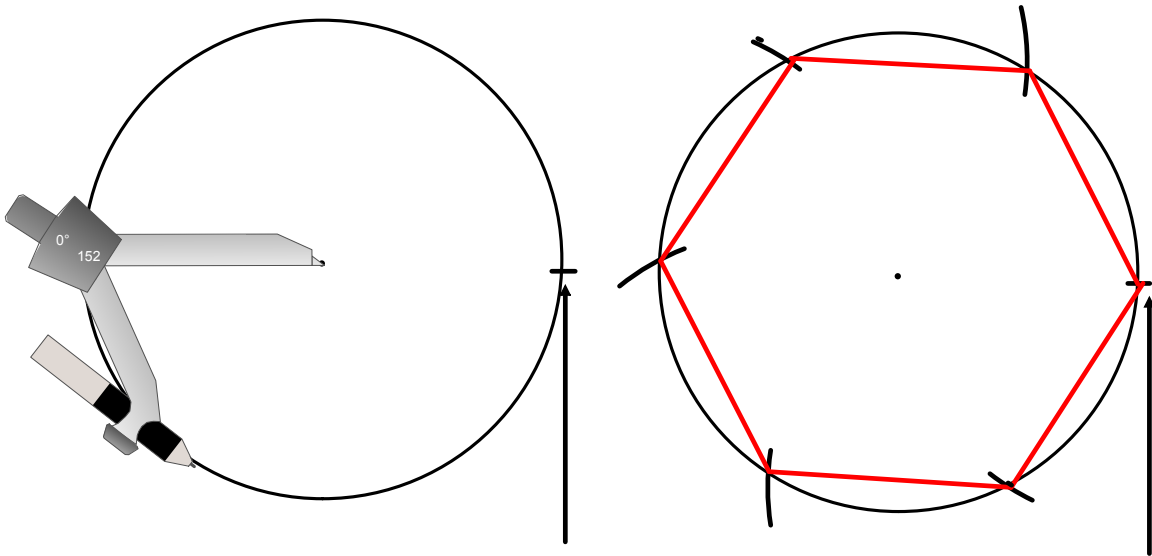
# CHRISTMAS DECAHEDRONS

Starter 1: On plain paper practice constructing equilateral triangles using a ruler and a pair of compasses. **Use a base of length 7cm.**



Measure all the sides and all the angles to check they are all the same.

Starter 2: On plain paper practice constructing a regular hexagon using a ruler and a pair of compasses. Start with a circle with **radius 7cm**



Make a mark at the "3 o'clock" position  
Step around the circumference with your compasses set to the radius of the circle.  
Join up the points around the circle to form a regular hexagon.

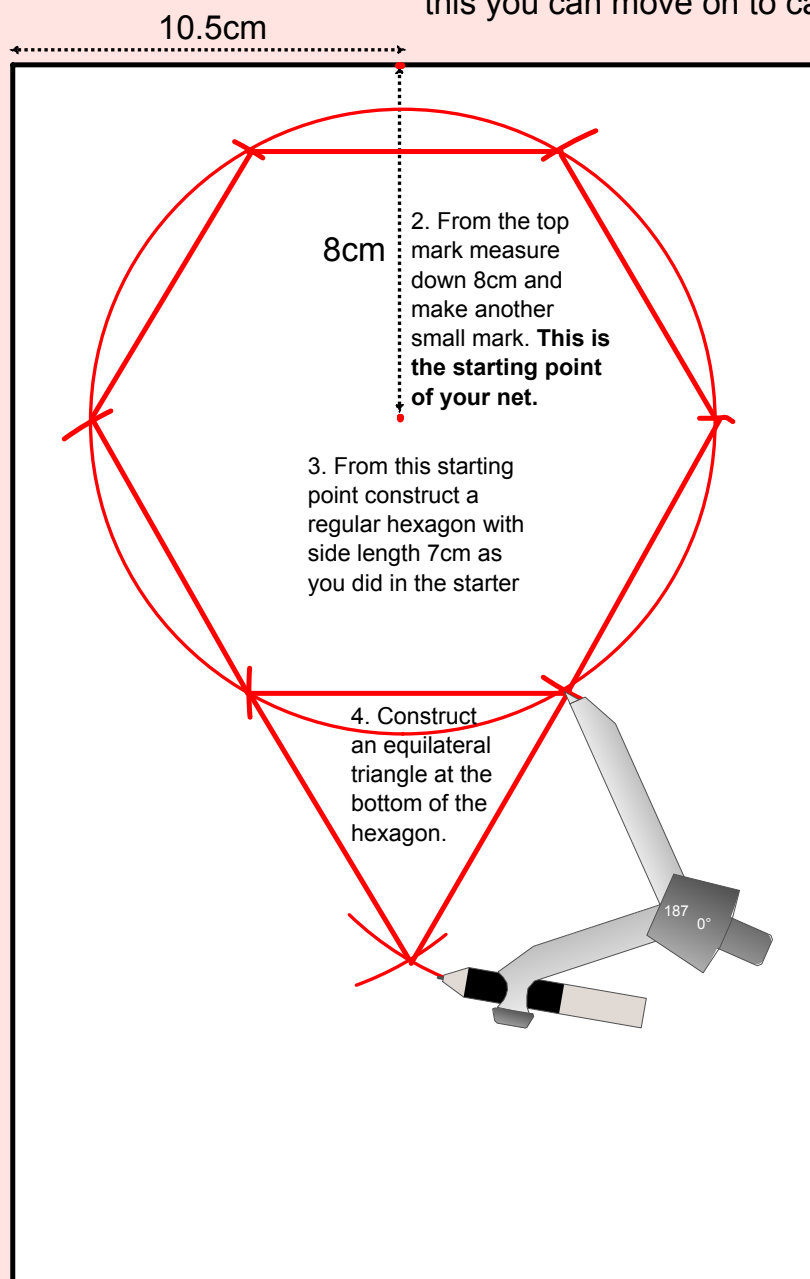
Measure all the sides and all the angles to check they are all the same.

You need to be really accurate at this before trying the next task. Keep practicing until you can draw a perfect regular hexagon.

# Net of a decahedron

Use a plain white piece of A4 paper to practice on. When you are good at this you can move on to card.

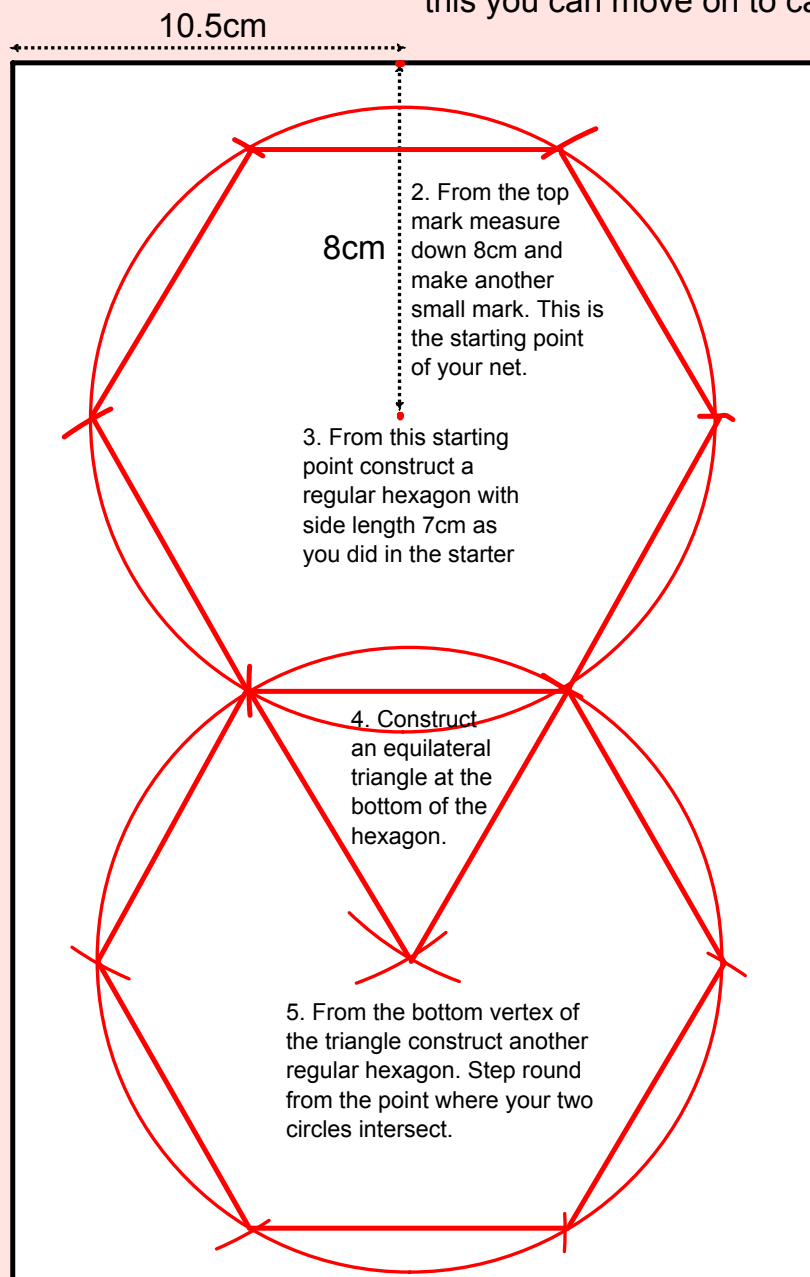
1. Measure 10.5 cm from the top left-hand corner and make a small mark.



# Net of a decahedron

Use a plain white piece of A4 paper to practice on. When you are good at this you can move on to card.

1. Measure 10.5 cm from the top left-hand corner and make a small mark.



2. From the top mark measure down 8cm and make another small mark. This is the starting point of your net.

3. From this starting point construct a regular hexagon with side length 7cm as you did in the starter

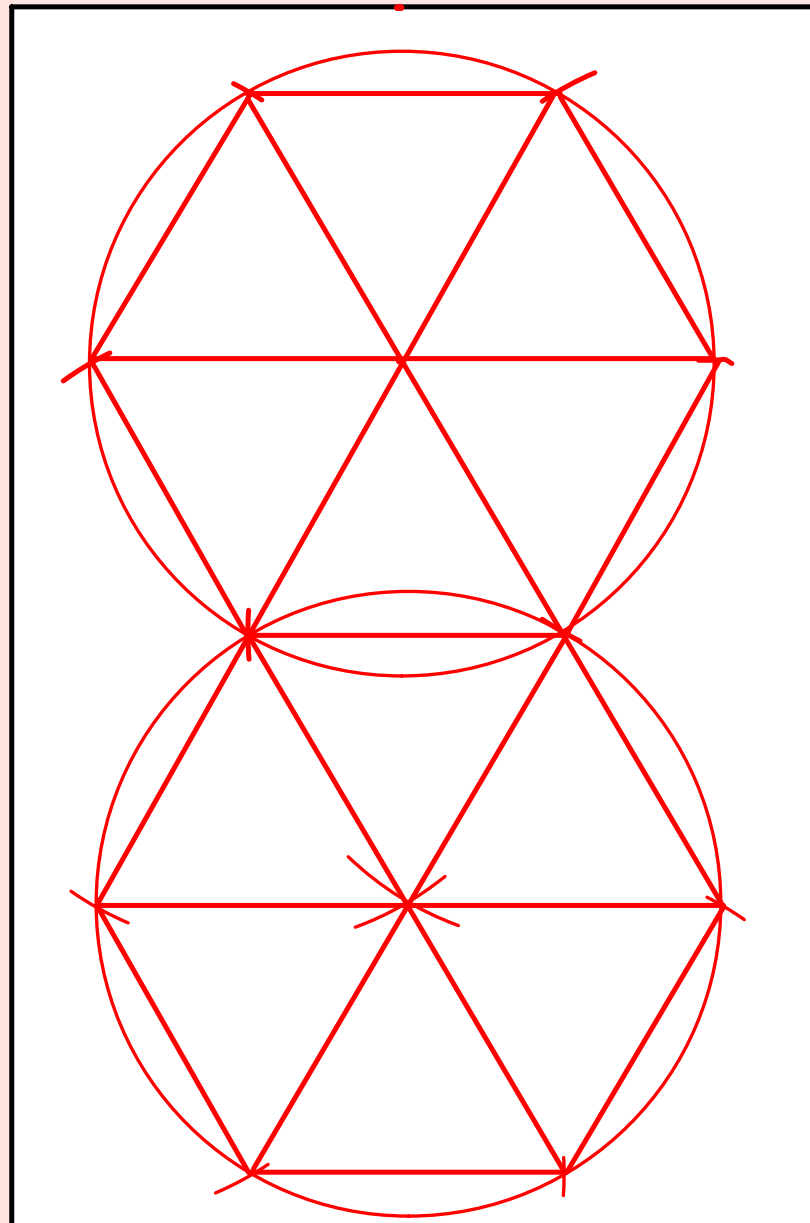
4. Construct an equilateral triangle at the bottom of the hexagon.

5. From the bottom vertex of the triangle construct another regular hexagon. Step round from the point where your two circles intersect.

# Net of a decahedron

Use a plain white piece of A4 paper to practice on. When you are good at this you can move on to card.

6. Draw on the lines connecting the opposite vertices to form a pattern like this.



# Net of a decahedron

Use a plain white piece of A4 paper to practice on. When you are good at this you can move on to card.

7. Add two more arcs as shown. Then mark on the tabs.

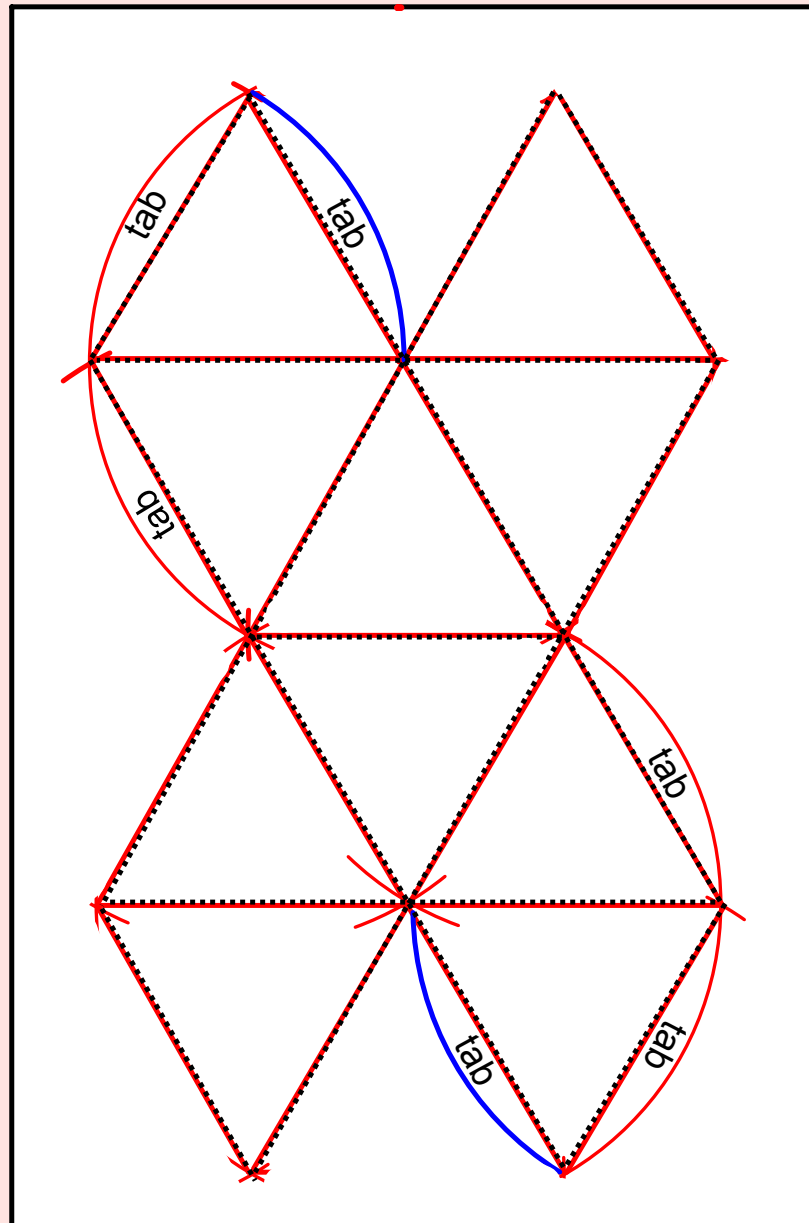
**Question: What kind of symmetry does the net have?**

8. Go back over the dotted lines with a very sharp pencil. this will help the net fold cleanly.

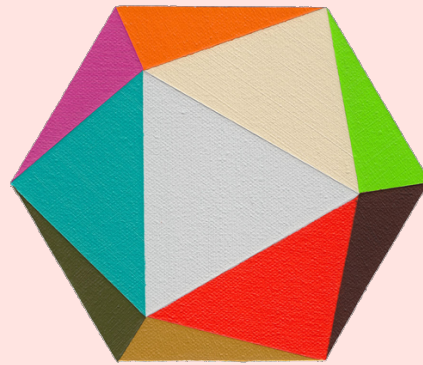
9. Cut out the net. Don't forget to include the tabs.

10. Fold to form a decahedron.

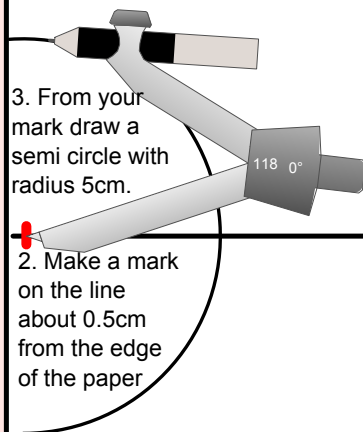
11. Before gluing the decahedron together, tape the ends of a loop of cord to the inside of the net. You can hang your decoration from this when complete.



Icosahedron = solid with 20 faces



Practice on a piece of A4 paper first  
before trying this on card



3. From your mark draw a semi circle with radius 5cm.

2. Make a mark on the line about 0.5cm from the edge of the paper

1. Draw this line about 6cm from the bottom of the sheet

Icosahedron = solid with 20 faces



Practice on a piece of A4 paper first  
before trying this on card

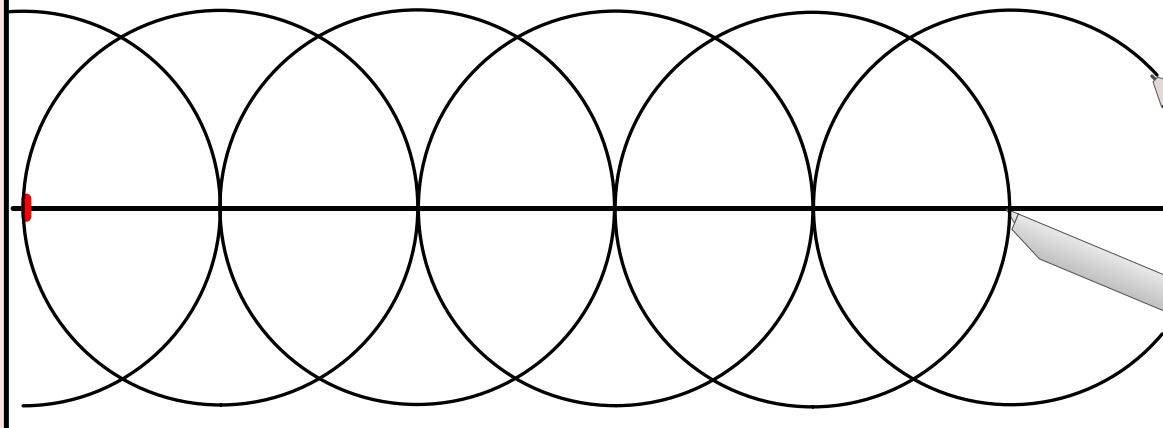
3. From your  
mark draw a  
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radius 5cm.

2. Make a mark  
on the line  
about 0.5cm  
from the edge  
of the paper

1. Draw this line about 6cm from the bottom of the sheet

4. Draw a series of circles with radius 5cm using  
the intersection of your previous circle and the  
horizontal line as the centre of the next circle.

5. Draw as much of the  
last circle as possible.

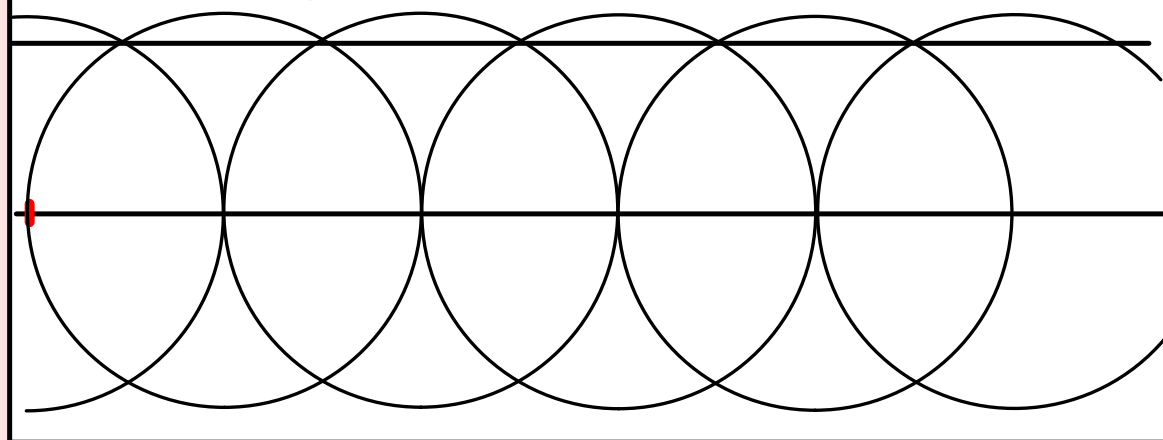


118  
0°

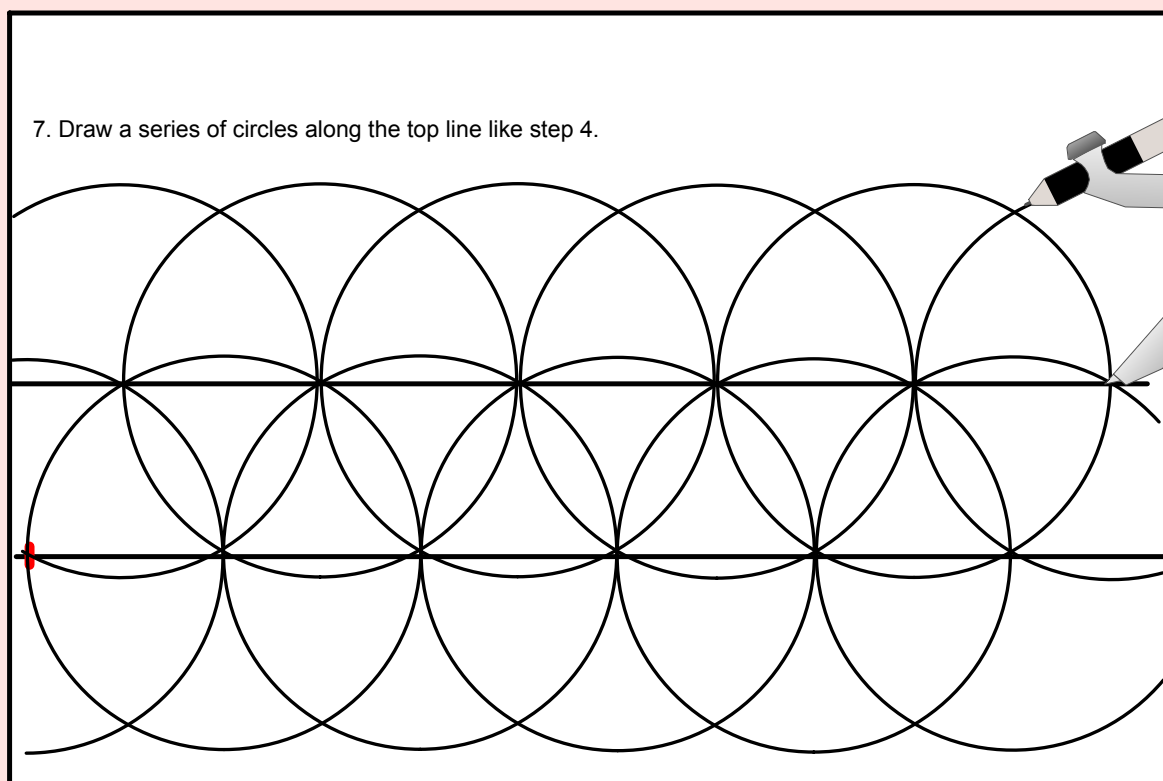
Icosahedron = solid with 20 faces



6. Draw a line through all the intersections of the circles



7. Draw a series of circles along the top line like step 4.

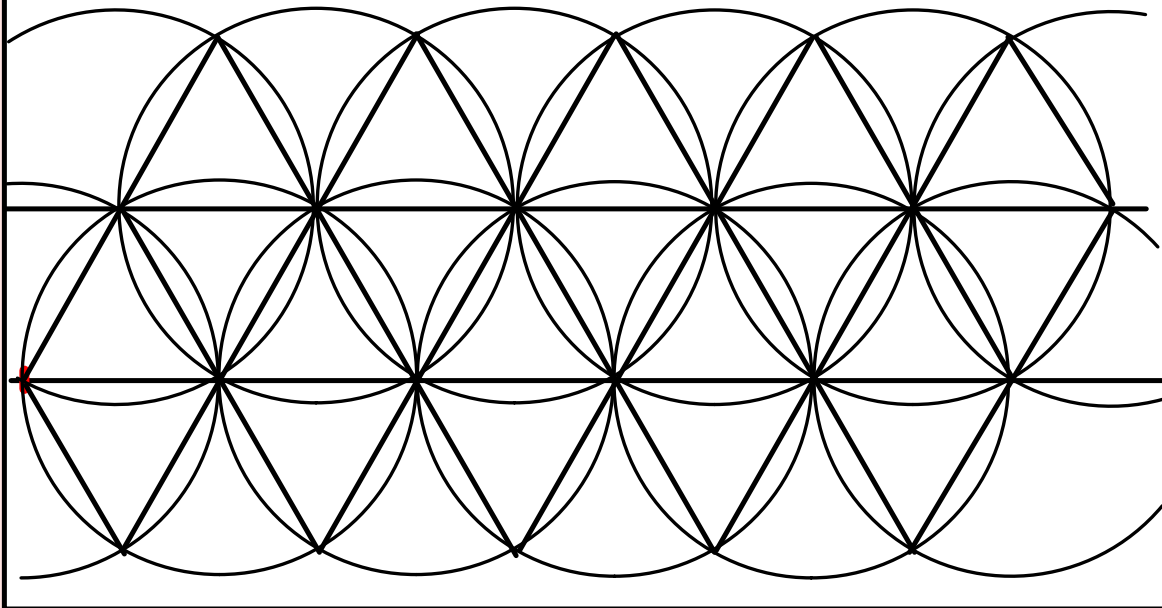




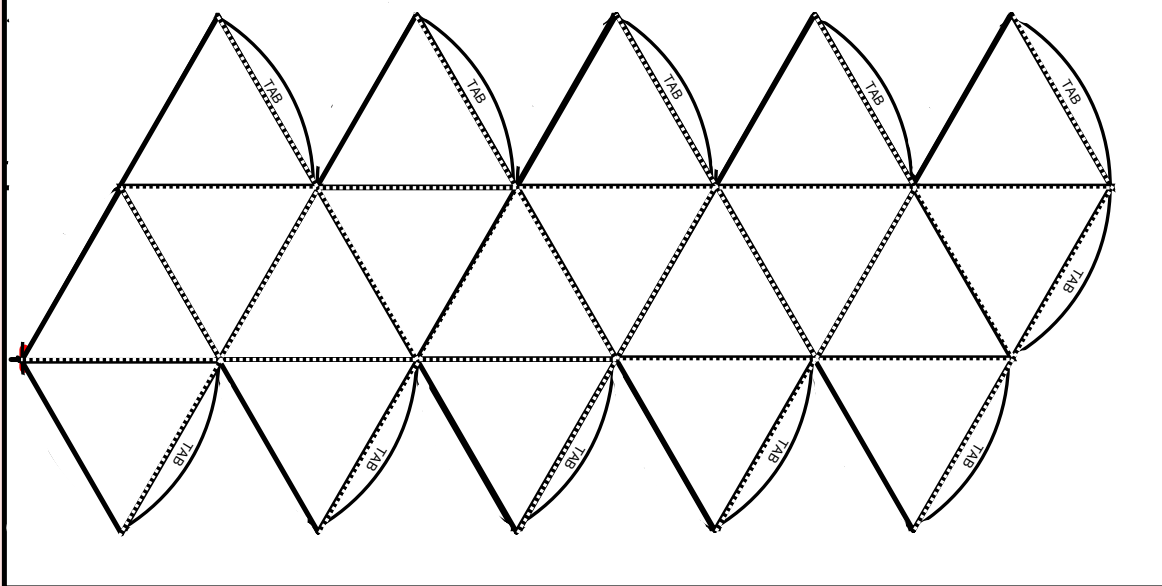
Icosahedron = solid with 20 faces



8. Connect the intersections with straight lines.




9. Here is the net with tabs shown. Score along the dotted lines, cut out and fold to make an icosahedron. Don't forget to tape the ends of a loop of cord to the inside of the net before gluing. You can hang your decoration from this when complete.



 <http://www.mathcats.com/crafts/octahedron.html>

 <http://www.mathcats.com/crafts/decahedron.html>

 <http://www.mathcats.com/crafts/icosahedron.html>

 <http://www.mathcats.com/crafts/icosahedron2.html>

