thoſe of the third order extend to the moſt diſtant; thoſe of the third to the leaſt; thoſe of the ſecond to the intermediate parallel.

When the whole line of lines repreſents 100, the diviſions of the firſt order, or thoſe to which the figures are annexed, repreſent tens; thoſe of the ſecond order units; thoſe of the third order the halves of theſe units. If the whole line repreſent ten, then the diviſions of the firſt order are units; thoſe of the ſecond tenths; the thirds twentieths.

In the line of tangents, the diviſions to which the numbers are affixed, are the degrees expreſſed by thoſe numbers. Every fifth degree is denoted by a line ſomewhat longer than the reſt; between every number and each fifth degree, there are four diviſions, longer than the intermediate adjacent ones, theſe are whole degrees; the ſhorter ones, or thoſe of the third order, are 30 minutes.

From the centre, to 60 degrees, the line of ſines is divided like the line of tangents, from 60 to 70; it is divided only to every degree, from 70 to 80, to every two degrees, from 80 to 90; the diviſion muſt be eſtimated by the eye.

The diviſions on the line of chords are to be eſtimated in the ſame manner as the tangents.

The leſſer line of tangents is graduated every two degrees, from 45 to 50; but from 50 to 60 to every degree; from 60 to the end, to half degrees.

The line of ſecants from 0 to 10 is to be eſtimated by the eye; from 20 to 50, it is divided to every two degrees; from 50 to 60, to every degree; from 60 to the end, to every half degree.

*Use of the Line of Equal Parts on the Sector.* 1. To divide a given line into any number of equal parts, ſuppoſe ſeven. Take the given line in your compaſſes; and ſetting one foot in a diviſion of equal parts, that may be divided by ſeven, for example 70, whoſe ſeventh part is 10, open the ſector till the other point fall exactly on 70, in the ſame line on the other leg. In this diſpoſition, applying one point of the compaſſes to 10 in the ſame line; ſhut them till the other fall in 10 in the ſame line on the other leg, and this opening will be the ſeventh part of the given line. Note, if the line to be divided be too long to be applied to the legs of the ſector, divide only one half or one fourth by ſeven, and the double or quadruple thereof will be the ſeventh part of the whole.

2. To meaſure the lines of the perimeter of a poly­gon, one of which contains a given number of equal parts. Take the given line in your compaſſes, and ſet it parallel, upon the line of equal parts, to the num­ber on each leg expreſſing its length. The ſector re­maining thus, ſet off the length of each of the other lines parallel to the former, and the number each of them falls on will expreſs its length.

3. A right line being given, and the number of parts it contains, ſuppoſe 120, to take from it a ſhorter line, containing any number of the ſame parts, ſuppoſe 25. Take the given line in your compaſſes, open the ſector till the two feet fall on 120 on each leg; then will the diſtance between 25 on one leg, and the ſame number on the other, give the line required.

4. Tο multiply by the line of equal parts on the lector. Take the lateral diſtance from the centre of the line to the given multiplicator: open the ſector till you fit that lateral diſtance to the parallel of 1 and 1, or 10 and 10, and keep the ſector in that diſpoſition; then take in the compaſſes the parallel diſtance of the multiplicand, which diſtance, meaſured laterally on the ſame line, will give the product required. Thus, ſup­poſe it were required to find the product of 8 multi­plied by 4: take the lateral diſtance from the centre of the line to 4 in your compaſſes, i. *e.* place one foot of the compaſſes in the beginning of the diviſions, and extend the other along the line to 4. Open the ſec­tor till you fit this lateral diſtance to the parallel of 1 and I, or 10 and 10. Then take the parallel diſtance of 8, the multiplicand; *i. e.* extend the compaſſes from 8, in this line, on one leg, to 8 in the ſame line on the other; and that extent, meaſured laterally, will give the product required.

5. To divide by the line of equal parts on the ſec­tor. Extend the compaſſes laterally from the begin­ning of the line to 1, and open the ſector till you fit that extent to the parallel of the diviſor; then take the parallel diſtance of the dividend, which extent, meaſured in a lateral direction, will give the quotient re­quired. Thus, ſuppoſe it was required to divide 36 by 4; extend the compaſſes laterally, the beginning of the line to r, and fit to that extent the parallel of 4, the diviſor; then extend the compaſſes parallel, from 36 on one leg to 36 on the other, and that extent, meaſured laterally, will give 9, the quotient required.

6. Proportion by the line of equal parts. Make the lateral diſtance of the ſecond term the parallel diſtance of the firſt term, the parallel diſtance of the third term is the fourth proportional. *Example.* To find a fourth proportional to 8, 4, and 6, take the lateral diſtance of 4, and make it the parallel diſtance of 8; then the pa­rallel diſtance of 6, extended from the centre, ſhall reach to the fourth proportional 3.

In the ſame manner, a third proportional is found to two numbers. Thus, to find a third proportional to 8 and 4, the ſector remaining as in the former example, the parallel diſtance of 4, extended from the centre, ſhall reach to the third proportional 2. In all theſe caſes, if the number to be made a parallel diſtance be too great for the ſector, ſome aliquot part of it is to be taken, and the anſwer is to be multiplied by the num­ber by which the firſt number was divided.

Use *of the Line oſ Chords on the Sector.* 1. To open the ſector ſo as the two lines of chords may make an angle or number of degrees, ſuppoſe 40. Take the di­ſtance from the joint to 40, the number of the degrees propoſed, on the line of chords; open the ſector till the diſtance from 60 to 60, on each leg, be equal to the given diſtance of 40; then will the two lines on the ſec­tor form an angle of 40 degrees, as was required.

2. The ſector being opened, to find the degrees of its aperture. Take the extent from 60 to 60, and lay it off on the line of chords from the centre; the num­ber whereon it terminates will ſhow the degrees, &c. required.

3. To lay off any number of degrees upon the cir­cumference of a circle. Open the ſector till the diſtance between 60 and 60 be equal to the radius of the given circle; then take the parallel extent of the chord of the number of degrees on each leg of the ſector, and