

also D' , through AD' being parallel to AD ; and so on. Then, with the judgment of the eye, fill in the contour between A' and B' similarly to that between A and B ; between B' and C' similarly to that between B and C ; and so on. Any two points in the larger figure should be just twice as far apart as the two corresponding points in the smaller, and this may be used to test the accuracy of the drawing.

Maps may, in this way, be reduced or enlarged, the first drawing being obtained by using translucent paper, or by tracing against a window pane. Of course the drawing of all maps is, in part, a question of the construction of similar figures.

Exercises.

1. Draw any line AB and divide it in the ratio of 7 to 8 by drawing another line ACD , inclined to AB at any angle, such that $AC=28$ and $CD=32$ millimetres, completing construction with parallel rulers. Verify result by measuring segments of AB .

2. Divide a line 4 in. long in the ratio 3.4 to 4.1.

3. There are three lines of lengths 27, 39 and 64 millimetres. Construct geometrically for a fourth proportional to them, and verify result by calculation and measurement.

4. A line is $4\frac{1}{2}$ in. in length. Divide it into three parts, such that they shall be to one another as 7 : 8 : 9.

5. Draw a line AB an inch long. Draw another line AC of length 50 millimetres, inclined to former at any angle. Divide the inch line into tenths.

6. Divide an inch into twelfths.

7. Draw AB , AC , making an angle of 47° with one another. In either of them take a point P and drop a perpendicular PN on the other. Measure the lengths of the sides of APN , and obtain the numerical values of the following ratios to two decimal places,—