

Enlargement and scale factors

Pearson Edexcel GCSE Mathematics 1MA1 • L030

Foundation and Higher • Lesson resources

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Purpose

Enlarge shapes from a stated centre, including positive fractional factors, and explain how centre and factor determine the image.

Vocabulary

Centre: fixed point from which displacements are scaled. Scale factor k : multiplier of directed distances from the centre. Similar: same shape, with corresponding lengths proportional.

Why the method works

For centre C and point P , the image lies k times as far along the ray CP for positive k . In coordinates $P' = C + k(P - C)$. Subtract the centre, multiply the displacement, then add the centre back. A factor between 0 and 1 makes the image smaller; $k=1$ leaves it unchanged.

Method and checking

Draw rays from the centre through vertices. Multiply each centre-to-vertex distance by k ; join images in order. Check a side-length ratio and one ray. The centre remains fixed.

Common errors and next attempt

If all coordinates are multiplied when the centre is not origin, first mark the displacement from the actual centre. If a half factor is called impossible, compare same ray distances. Recheck $C(1,1)$, $P(3,1)$, $k=2 \rightarrow (5,1)$.