Name: _____

Unit 4 – Geometry
4.6 – Drawing Similar Figures

Reducing the Size of a Figure - The RATIO method

This method is used to create a **reduction** of any shape. Use the following steps:

    a.   Draw the shape you want to reduce.
    b.   Mark a point outside the shape (a vanishing point) on one side and above the shape - this point will become the **centre of reduction**.
    c.   Draw lines connecting the centre of reduction to each vertex of your original shape (reducing lines).
    d.   Measure these distances **from the centre of reduction to each vertex**, in mm.
    e.   Choose a scale factor to reduce the image.
    f.   Multiply the distances by the scale factor.
    g.   Using the new values to measure from the centre of reduction along each reducing line and make a mark.
    h.   Connect the marks on the reducing lines.

**Example:** Reduce the following shape by a scale factor of $\frac{1}{2}$.

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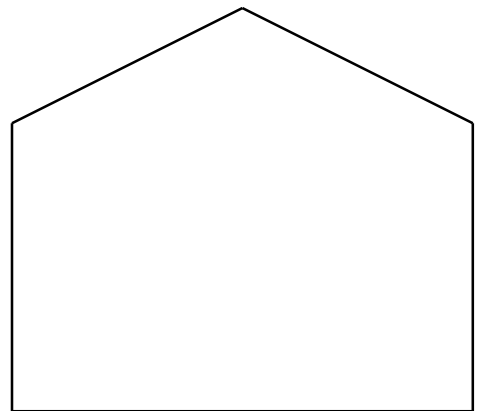
Enlarging the Size of a Figure - The PARALLEL method

This method is used to create an *enlargement* of any shape. Use the following steps:
   a. Draw the shape you want to enlarge.
   b. Mark a point that is inside of the shape (it does not have to be in the centre of the shape) - this point will become the *centre of enlargement.*
   c. Draw lines connecting the centre of enlargement to each vertex of your original shape (enlarging lines) and extend the lines well beyond the original shape.
   d. Measure the distances **from the centre of enlargement to each vertex**, in mm.
   e. Choose a scale factor to enlarge the image.
   f. *Multiply* the distances by the scale factor, e.g. multiply by 2 for a scale factor of 2, multiply by 3 for a scale factor of 3, etc.
   g. Measure these distances from the centre of enlargement along each enlarging line and make a mark.
   h. Connect the marks on the enlarging lines.

**Example:** Enlarge the following shape by a scale factor of 3.
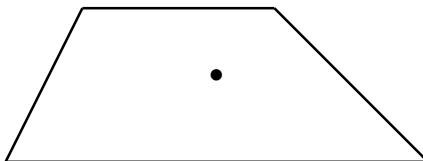
Assignment

1. Given the two figures below, determine the scale factor of reduction when starting with the diagram on the left and finishing with the diagram on the right. Explain your reasoning. **HINT:** Use information from at least *three* sides.
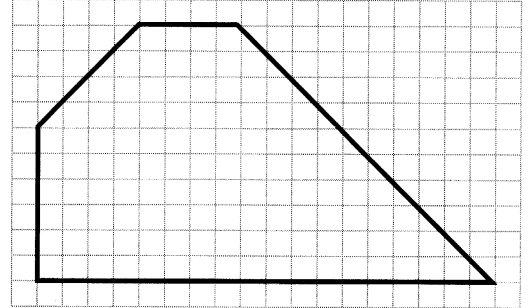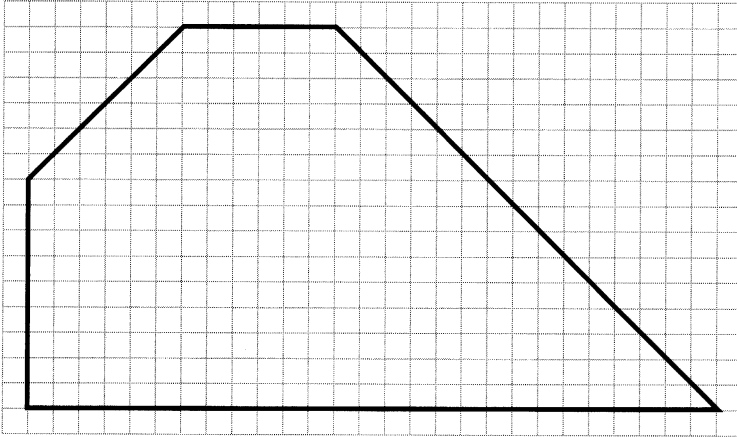

2. Use the *ratio method* to **reduce** the following figure by a scale factor of 4 or multiply by **scale factor** $\frac{1}{4}$.
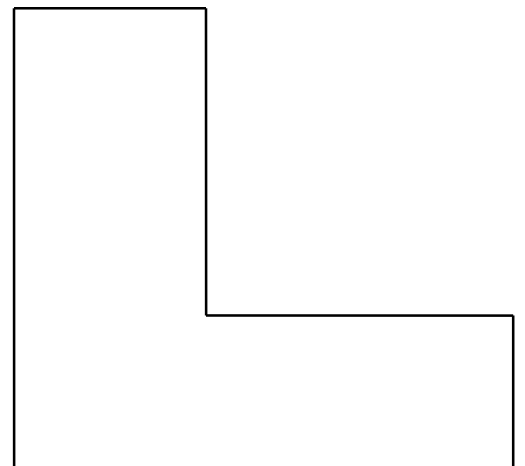
3. A craft store uses small gift boxes to wrap purchases. They have one box that is 20 cm by 12 cm by 5 cm. Another box is larger by a scale factor of 1.3. What are the dimensions of the larger box?

4. Simrin has built two end tables. The second table is a slightly larger version of the first. Given the dimensions below, calculate what scale factor Simrin used to make the larger table. Use all the dimensions to show the scale factor.
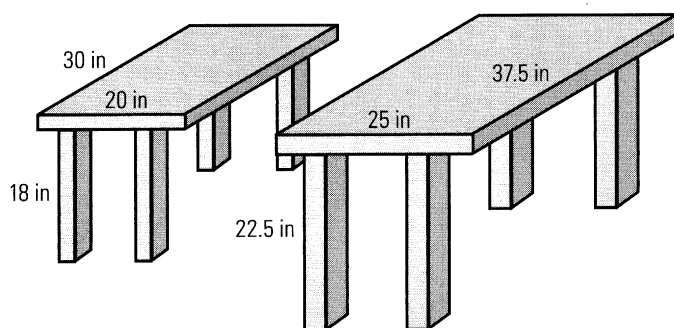
5. Use the *parallel method* to **enlarge** the following figure by a **scale factor of 2**.