

Dilation Exemplar Instruction Card

- Draw an original polygon, label it "original," and estimate its area.*
- Choose the location of a fixed point and label it "fixed point."
- Choose a scale factor for an enlargement or a reduction (must fit on the page).
- Draw dashed lines from the fixed point to each vertex on the polygon.
- Measure and label the length of each dashed line in centimeters (i.e., 5.1 cm).
- Multiply each measurement by the scale factor to find the correct distances between the fixed point and the new vertices along the same dashed lines.
- Draw each new vertex (extend dashed lines as needed), connect the new vertices, and label the new polygon "new."
- Estimate the new polygon's area. Compare to: $A_{\text{new}} = A_{\text{original}} \cdot (\text{scale factor})^2$

**Use graph paper and choose a shape with an area that is easy to estimate.*

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**Use graph paper and choose a shape with an area that is easy to estimate.*

Dilation: _____

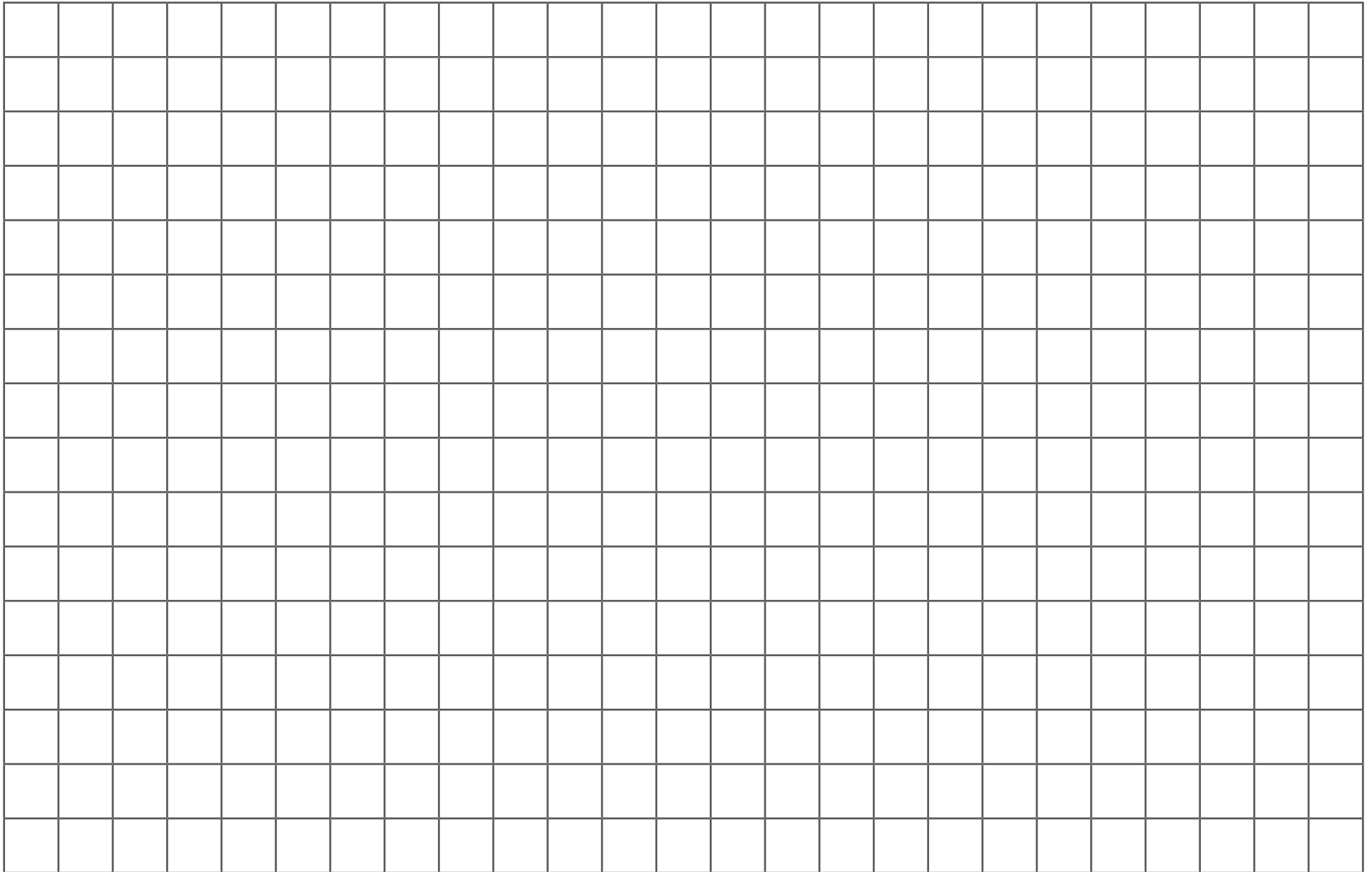
Scale Factor = _____

Name: _____

$A_{\text{original}} \approx$ _____ cm^2

$A_{\text{new}} \approx$ _____ cm^2

$A_{\text{calculated}} = (\quad) \cdot (\quad)^2 =$ _____ cm^2



Step-by-step Dilation Guide

□ Draw an original polygon, label it "original," and estimate its area.*

*Use graph paper and choose a shape with an area that is easy to estimate.

Dilation: _____

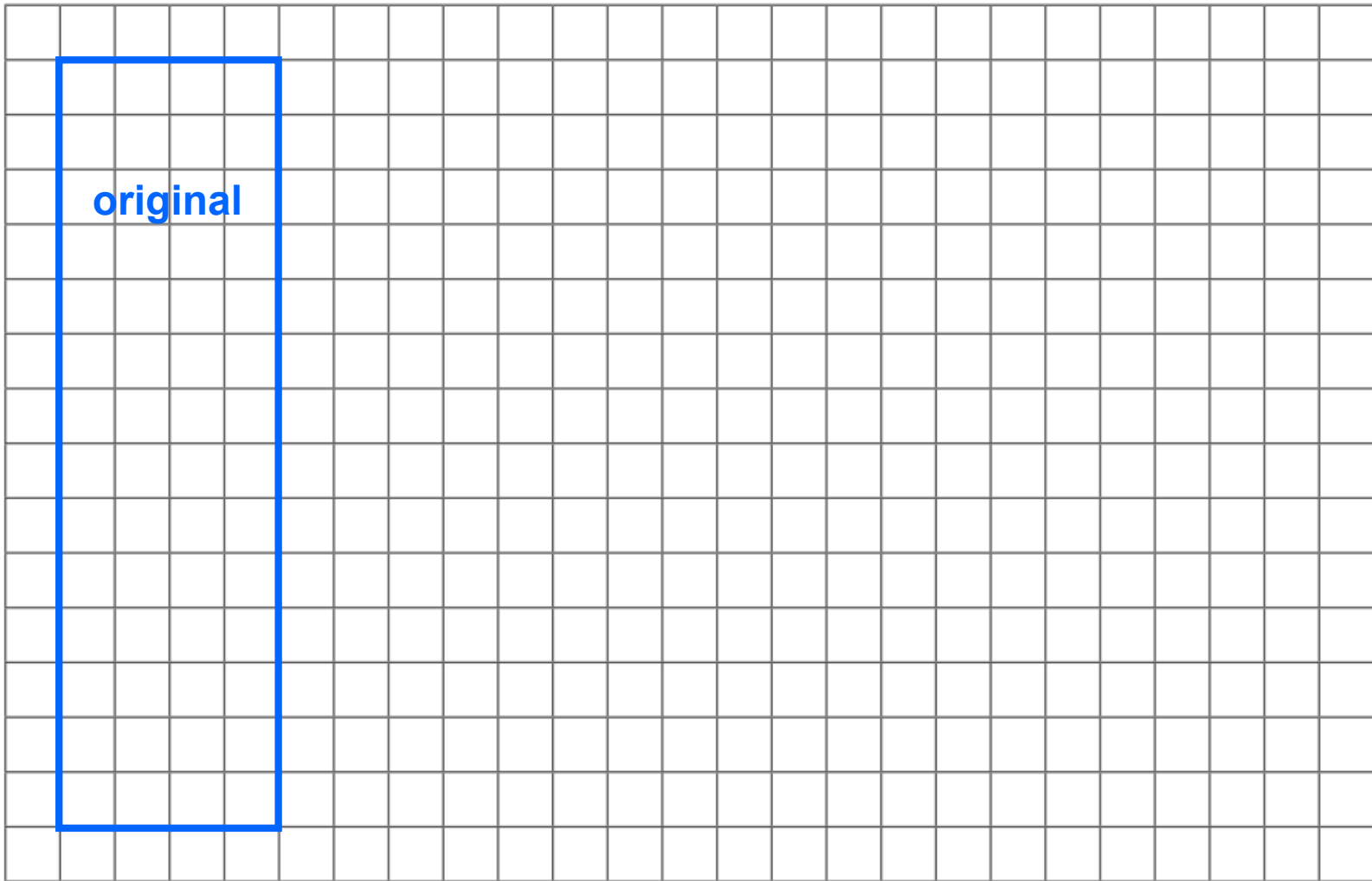
Scale Factor = _____

Name: Jacky Jackson

$A_{\text{original}} \approx$ 56 cm^2

$A_{\text{new}} \approx$ _____ cm^2

$A_{\text{calculated}} = (\quad) \cdot (\quad)^2 =$ _____ cm^2



Step-by-step Dilation Guide

- ❑ Choose the location of a fixed point and label it "fixed point."

Dilation: _____

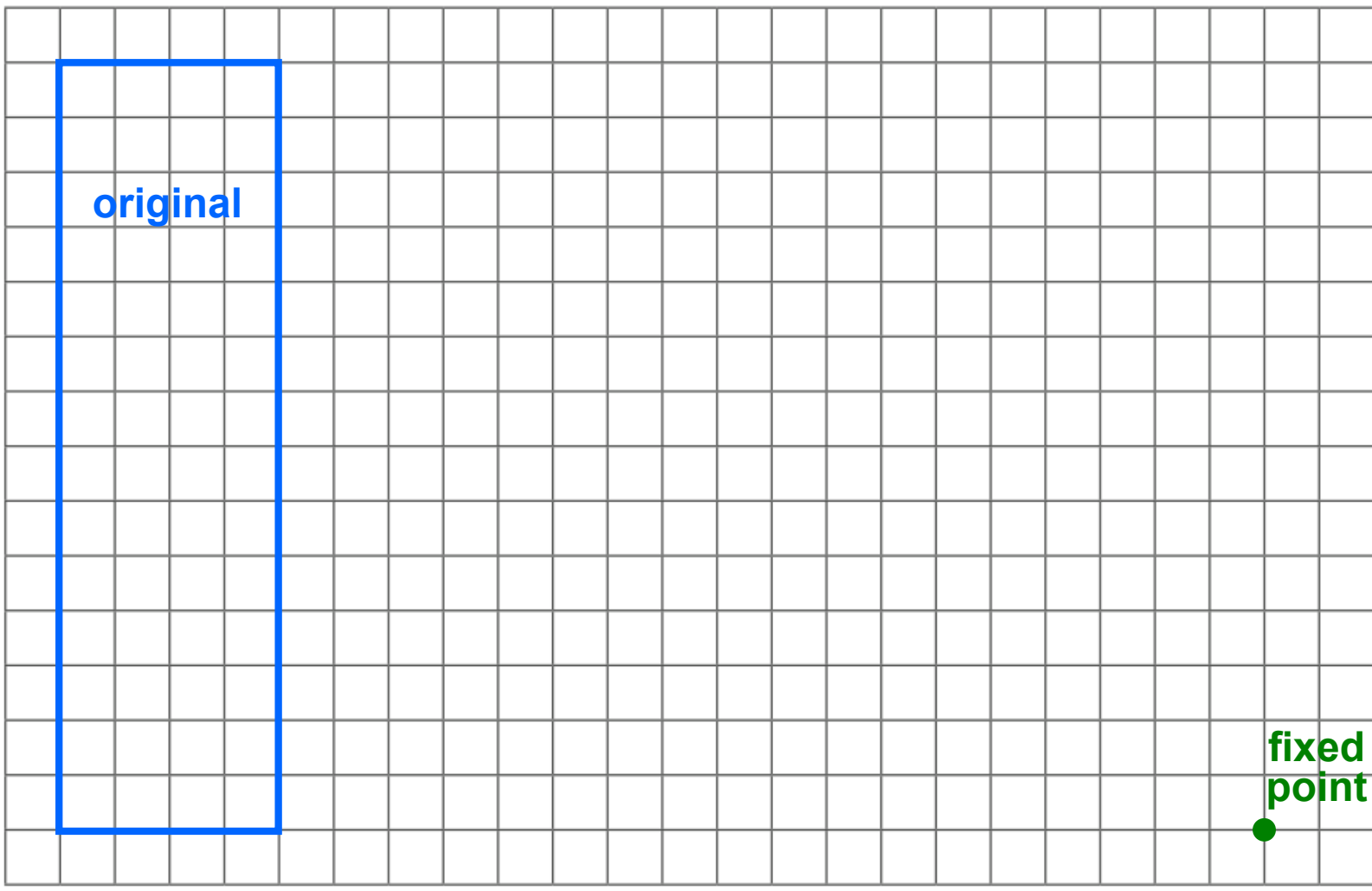
Scale Factor = _____

Name: Jacky Jackson

$A_{\text{original}} \approx$ 56 cm^2

$A_{\text{new}} \approx$ _____ cm^2

$A_{\text{calculated}} = (\quad) \cdot (\quad)^2 =$ _____ cm^2



Step-by-step Dilation Guide

- Choose a scale factor for an enlargement or a reduction (must fit on the page).

Dilation: Reduction

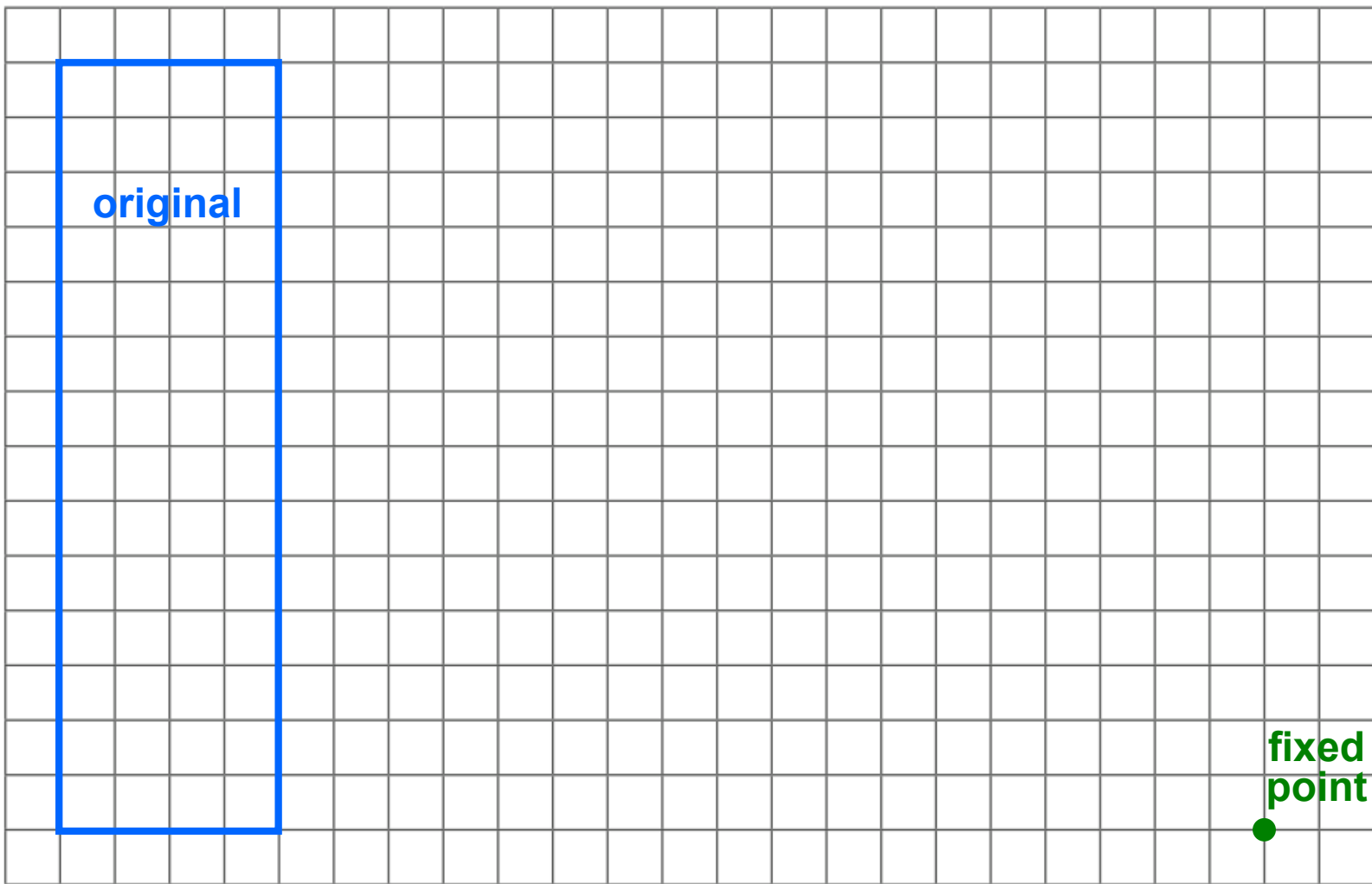
Scale Factor = $\frac{1}{2}$

Name: Jacky Jackson

$A_{\text{original}} \approx$ 56 cm^2

$A_{\text{new}} \approx$ _____ cm^2

$A_{\text{calculated}} = (\quad) \cdot (\quad)^2 =$ _____ cm^2



Step-by-step Dilation Guide

- Draw dashed lines from the fixed point to each vertex on the polygon.

Dilation: Reduction

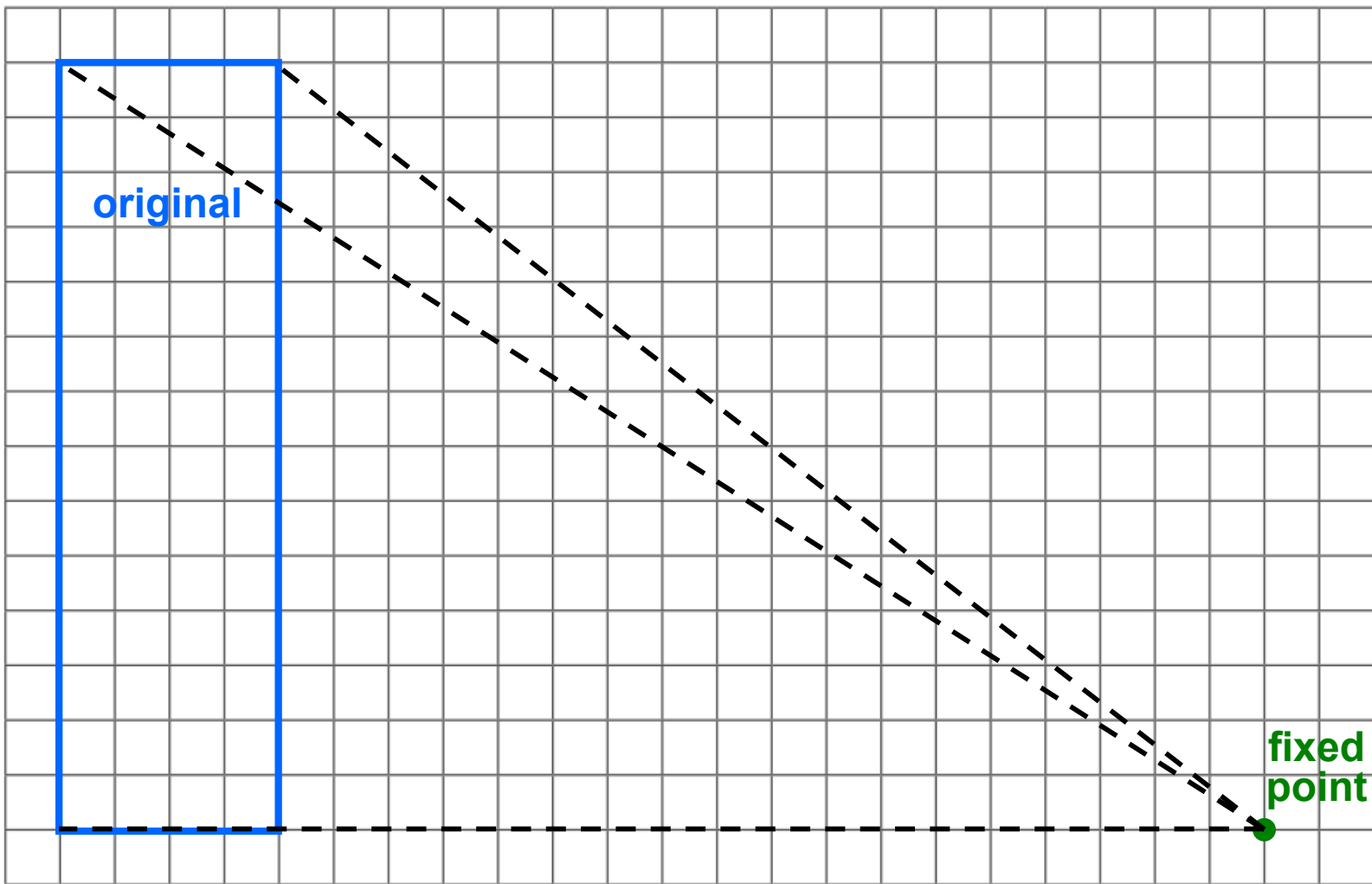
Scale Factor = $\frac{1}{2}$

Name: Jacky Jackson

$A_{\text{original}} \approx$ 56 cm^2

$A_{\text{new}} \approx$ _____ cm^2

$A_{\text{calculated}} = (\quad) \cdot (\quad)^2 =$ _____ cm^2

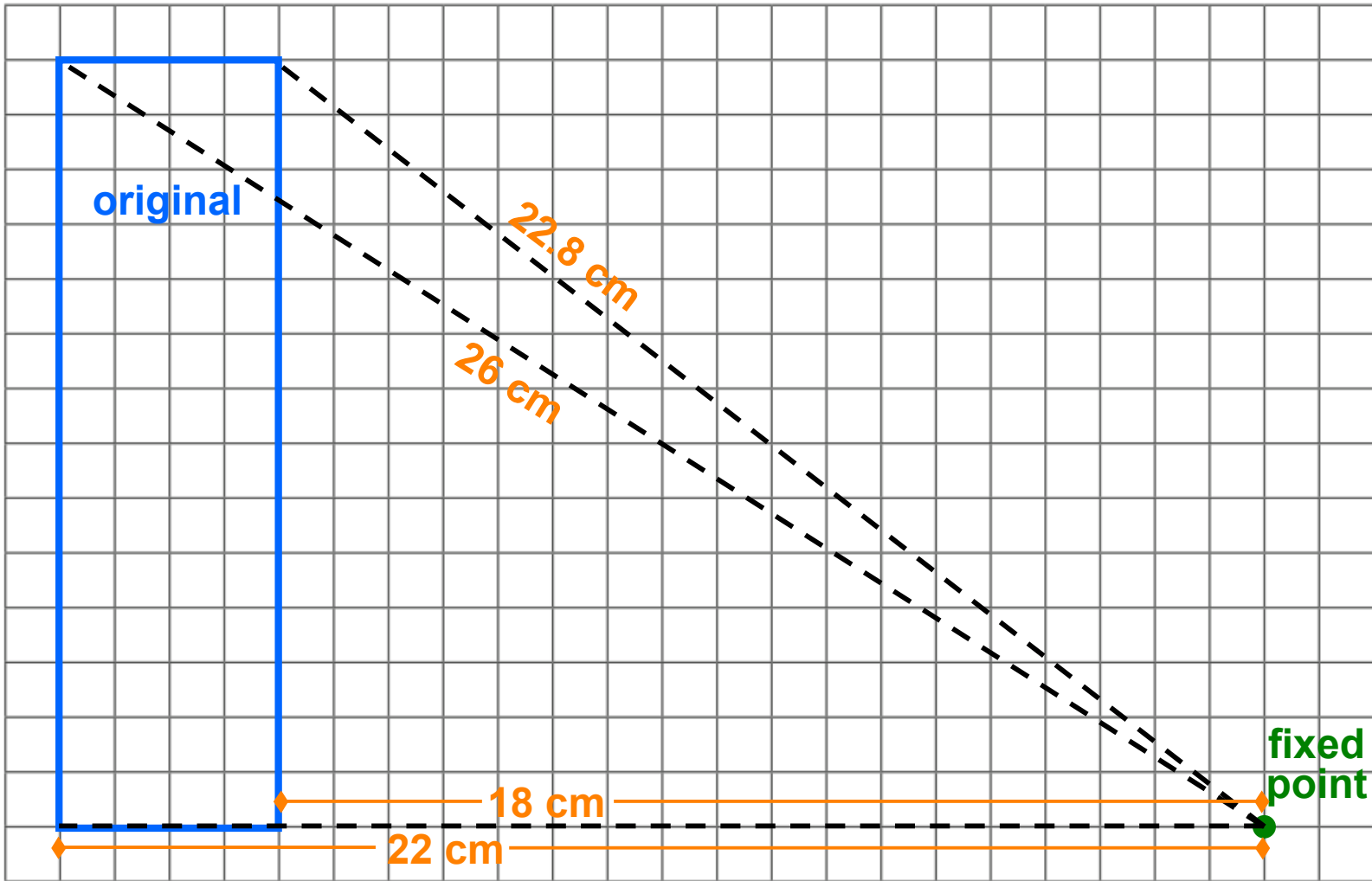


Step-by-step Dilation Guide

- Measure and label the length of each dashed line in centimeters (i.e., 5.1 cm).

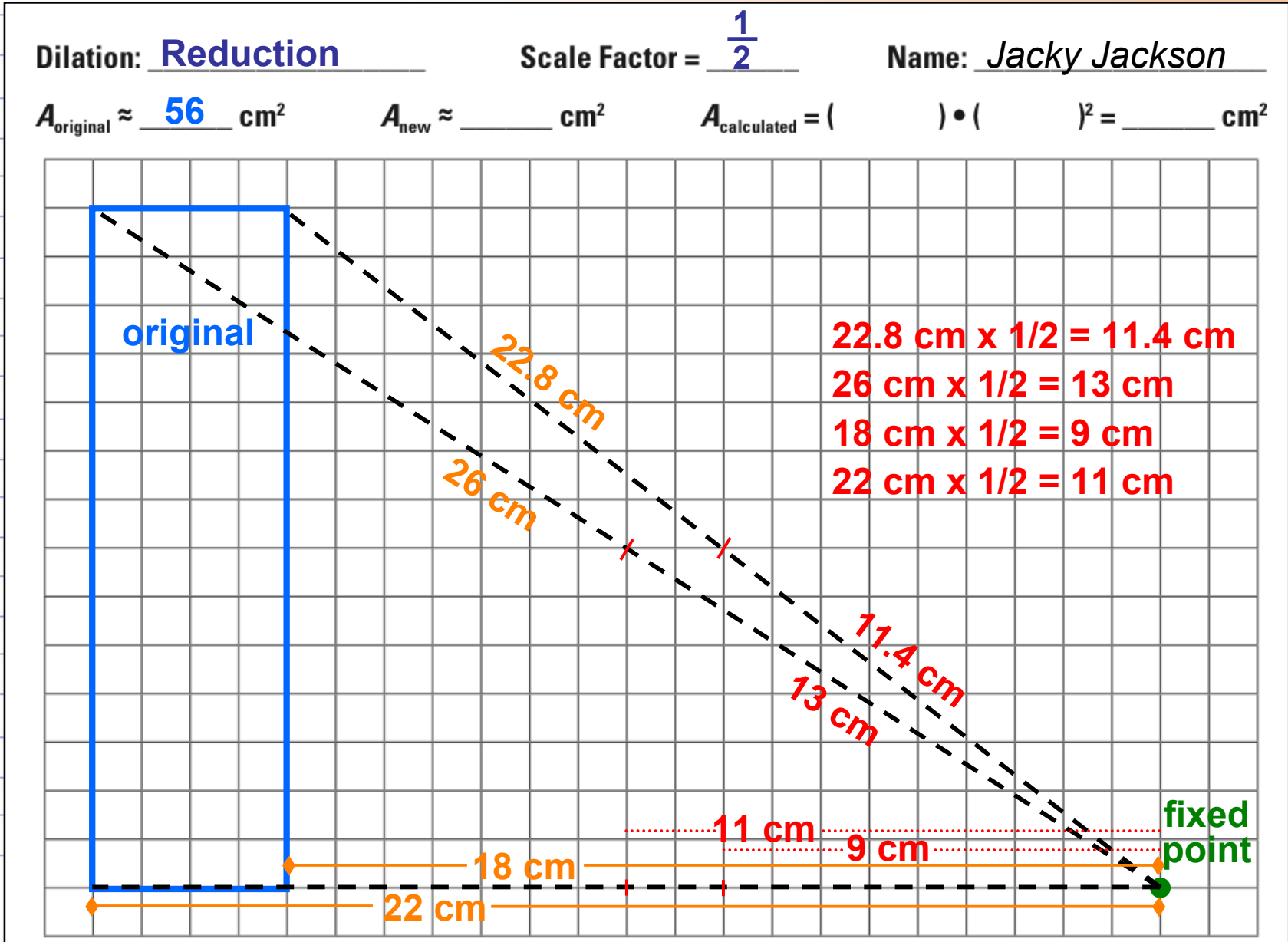
Dilation: Reduction Scale Factor = $\frac{1}{2}$ Name: Jacky Jackson

$A_{\text{original}} \approx$ 56 cm^2 $A_{\text{new}} \approx$ _____ cm^2 $A_{\text{calculated}} = (\quad) \cdot (\quad)^2 =$ _____ cm^2



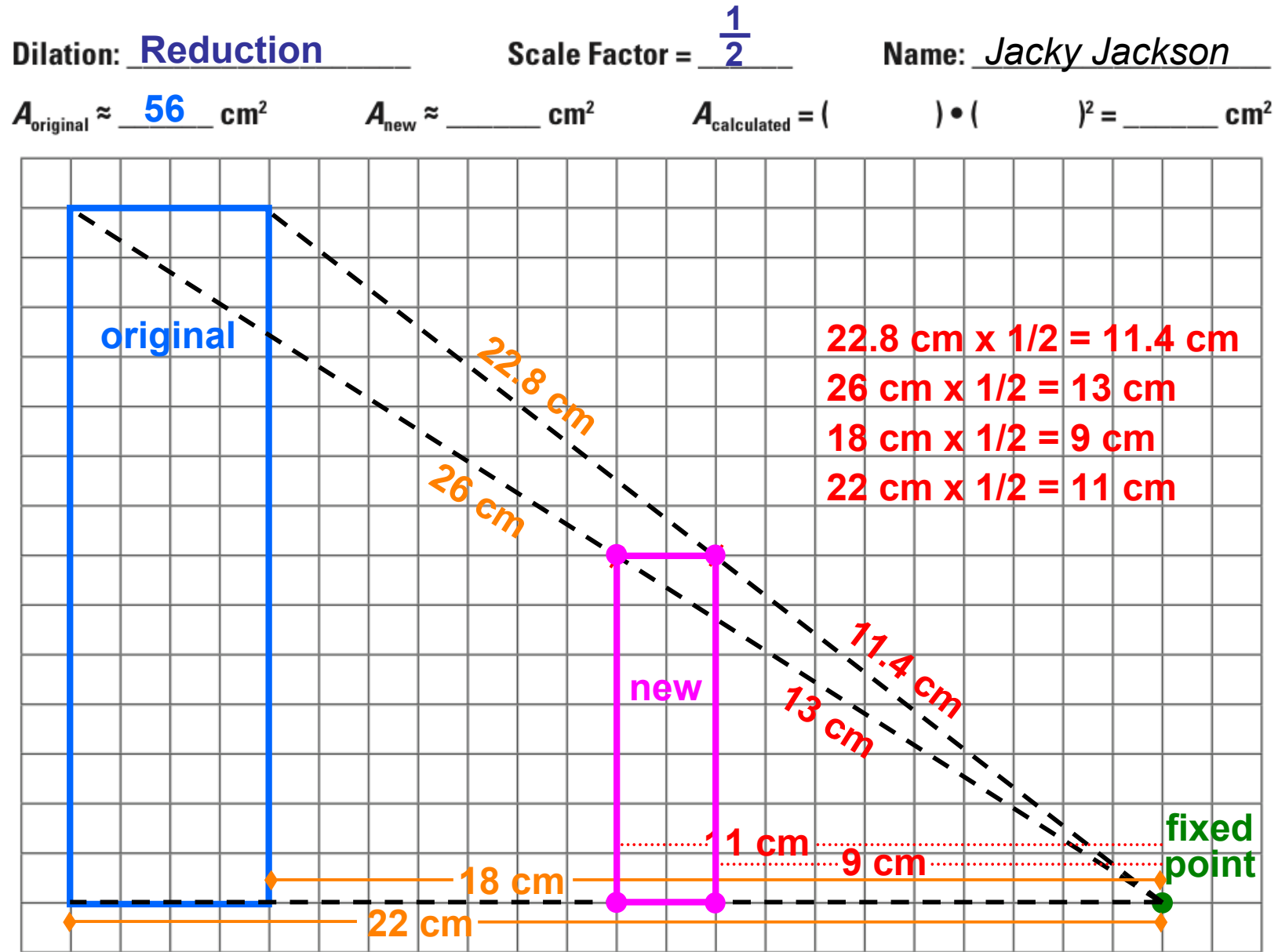
Step-by-step Dilation Guide

- Multiply each measurement by the scale factor to find the correct distances between the fixed point and the new vertices along the same dashed lines.



Step-by-step Dilation Guide

- Draw each new vertex (extend dashed lines as needed), connect the new vertices, and label the new polygon "new."



Step-by-step Dilation Guide

- Estimate the new polygon's area.

Compare to: $A_{\text{new}} = A_{\text{original}} \cdot (\text{scale factor})^2$

Dilation: Reduction

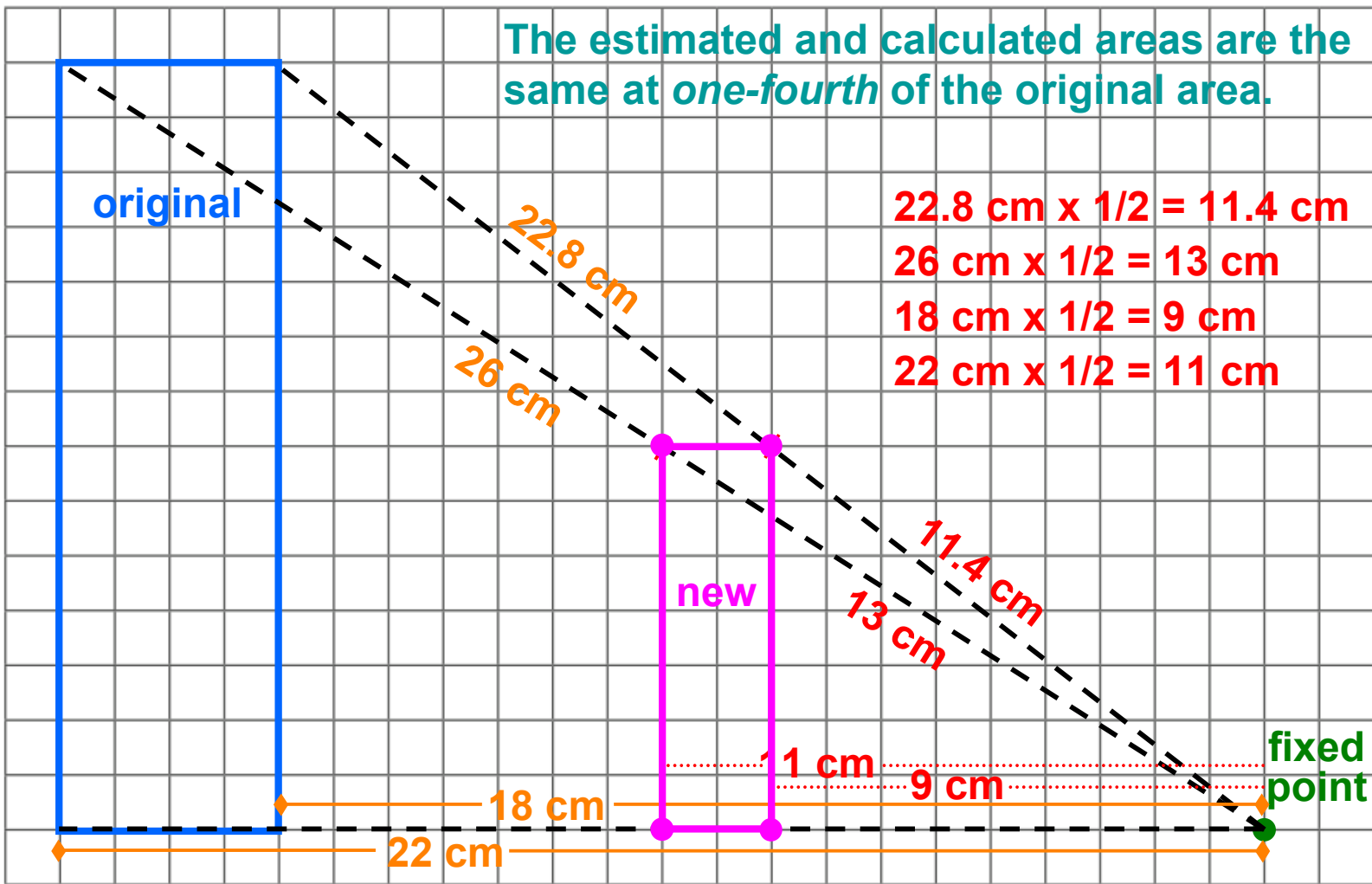
Scale Factor = $\frac{1}{2}$

Name: Jacky Jackson

$A_{\text{original}} \approx$ 56 cm^2

$A_{\text{new}} \approx$ 14 cm^2

$A_{\text{calculated}} = ($ 56 $) \cdot ($ $\frac{1}{2}$ $)^2 =$ 14 cm^2



Another Example

What if the fixed point was moved to a vertex?

Dilation: Reduction

Scale Factor = $\frac{1}{2}$

Name: Jacky Jackson

$A_{\text{original}} \approx$ 56 cm^2

$A_{\text{new}} \approx$ 14 cm^2

$A_{\text{calculated}} = ($ 56 $) \cdot ($ $\frac{1}{2}$ $)^2 =$ 14 cm^2

The estimated and calculated areas are the same at *one-fourth* of the original area.

