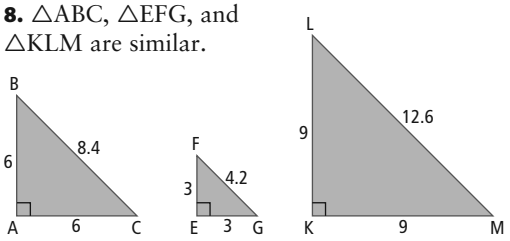
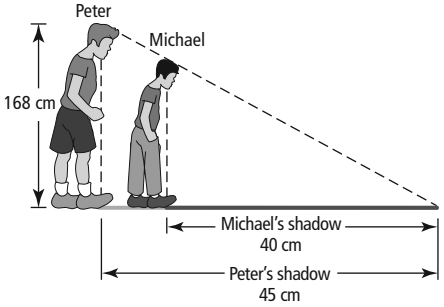
4.3 Similar Triangles, pages 150–153

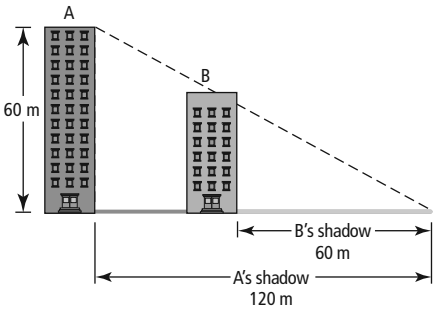
4. Corresponding angles: ∠P and ∠T, ∠Q and ∠U, ∠R and ∠V.
Corresponding sides: PQ and TU, PR and TV, QR and UV.
5. Corresponding angles: ∠A and ∠Y, ∠B and ∠W, ∠C and ∠X.
Corresponding sides: AB and YW, BC and WX, AC and YX.
6. Yes, the triangles are similar because the sides are the proportional; the sides are related by a scale factor of 5.
7. No, the triangles are not similar because the sides are not proportional.
8. △ABC, △EFG, and △KLM are similar.



9. $x = 56$
10. $x = 10$
12. 2.0 m
13. 4.0 m
14. 7.68 m
15. $x = 76.25$ cm
16. Peter is taller. Michael is 149.3 cm tall.



17. Example: Two buildings, A and B, stand side by side. Building A casts a shadow of 120 m and is 60 m tall. Building B has a shadow of 60 m. Using the diagram, find the height of Building B.

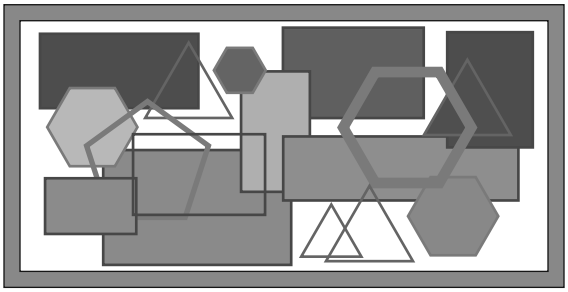


$\frac{60}{120} = \frac{x}{60}$
Building B is 30 m tall.

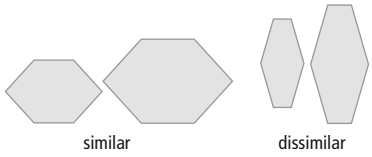
18. a) $x = 420.48$ m **b)** The shadow may not reach the street level due to surrounding buildings.
19. a) No, the corresponding angles are not equal. The angle measures of one triangle are: 50°, 60°, and 70°. The angle measures of the other triangle are: 50°, 50°, and 80°. **b)** Yes, the triangles are similar because they both have angle measures of 45°, 60°, and 75°.
20. a) 13.3 cm and 16.0 cm **b)** 1:2.67
21. First, measure your height, and the length of the building's shadow. After measuring your own shadow, find the ratio of your shadow to the building's shadow. Then, divide your height by that value to find the height of the building.
22. $ZY = 4.9$ cm
23. The area is 150 cm^2.

4.4 Similar Polygons, pages 157–159

3. a) Similar **b)** Not similar
4.

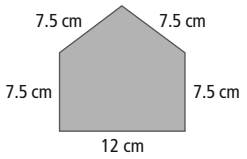


5. $x = 4$
6. $x = 2.8$ m
7. No. The corresponding angles must be the same.
8. a)



b) The two similar hexagons are similar to the photo because the interior angles are the same and the side lengths are related by a scale factor. The two dissimilar hexagons do not have these properties.
9. The side length of the game board will be 15.0 cm.
10. a) 7.5 m **b)** 1080°. Example: An octagon can be divided into six non-overlapping triangles.
11. a) The final enlargement should be 6 times the size of the original diagram. **b)** The corresponding angles are equal, and the dimensions are all enlarged by the same proportion.
12. 39.3 cm
13. 14.1 cm

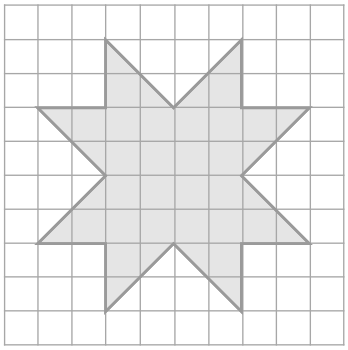
14. a) $\frac{1}{20}$ **b)**



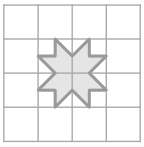
c) $\text{length}_{\text{model}} = 15$ cm, $\text{width}_{\text{model}} = 12$ cm
15. 19 250 L
16. The ratio of areas to the ratio of corresponding side lengths in similar polygons is equal to the scale factor comparing side lengths squared.
17. The volume ratio is the same as the side ratio cubed.
18. a) The similar polygons have 7 sides, so they are heptagons. **b)** Example: Each heptagon is a reduction of the centre heptagon, with the scale factor decreasing with distance from the centre.

Chapter 4 Review, pages 160–161

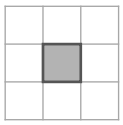
1. POLYGON
2. SIMILAR
3. SCALE FACTOR
4. PROPORTION
5. a)



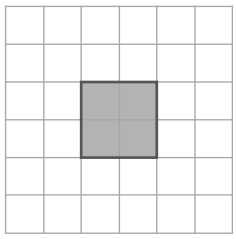
b)



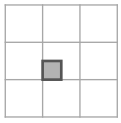
6. The vertical height of the drawing is 3 cm. The enlarged egg will have a vertical height of 9 cm.
7. The vertical height of the drawing is 3 cm. The reduced drawing will have a vertical height of 1.5 cm.
8. a)



b)



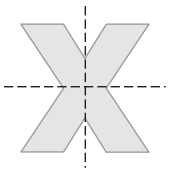
c)



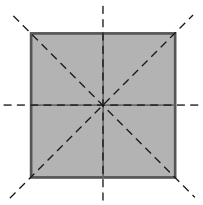
9. $\frac{2}{13}$
10. a) 14 cm **b)** 13.9 cm
11. 8.7 cm
12. $\frac{1}{10\ 000\ 000}$
13. No. The corresponding sides are not proportional.
14. $x = 10$
15. $x = 3$
16. The polygons are not similar.
17. 10.1 cm
18. $x = 7.2$; $y = 9.6$

Chapters 1–4 Review, pages 166–168

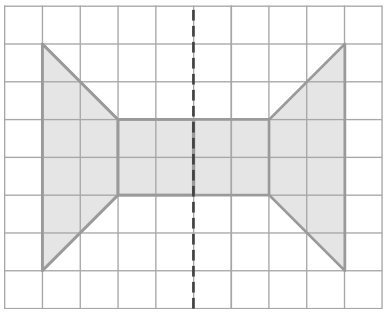
1. a)



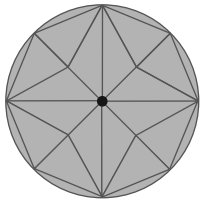
b)



2. Example: The shape could be traced and cut out, then flipped over the dashed line and traced as the reflected image or each point could be reflected over the dashed line and connected to create the shape.



3.



a) Example: There are four lines of symmetry, 1 vertical, 1 horizontal and 2 oblique. **b)** Example: 4
c) 90°, $\frac{1}{4}$ revolution

4. a) Example: Diameter of circular cake and side length of square cake are 25 cm. Height of both cakes is 10 cm. Square: 1625 cm^2, circle: 1276.5 cm^2
b) Example: Square: 2625 cm^2, an increase of 61.5%. Circle: 2276.3, an increase of 78.3%.