

Applications

1. a. 30 ft
b. 27 ft 6 in.
2. a. approx. 5 ft 7 in.
b. approx. 7 ft $2\frac{1}{2}$ in.
3. and 4. (**Note:** Labsheet 1ACE: Exercises 3, 4, 12 has left-handed and right-handed versions of these questions.)
 - a. The original lengths are half the new lengths. Or the new lengths are 2 (scale factor) times the original lengths.
 - b. The perimeter of the original figure is half the perimeter of the new figure. Or the perimeter of the new figure is 2 (scale factor) times the original perimeter.
 - c. Angles remain the same.
 - d. The area of the original figure is $\frac{1}{4}$ the area of the new figure. Area of the new figure is 4 times the original area. It takes 4 copies of the original figure to cover its stretched image.
 - e. The distance of each point in the original figure from P is half the distance of the corresponding point in the image. Or each image point is twice the distance from P as its corresponding point on the original figure.
5. a. 50%; Students can use a side of a piece of paper to compare the side lengths of the floor plan.
b. The line segments in the original plan are twice the lengths of the corresponding sides in the reduced plan. (Or the line segments in the reduced plan are half as long as the corresponding line segments in the original plan.)
c. The area of the whole house in the original plan is about 4 times the area of the reduced plan. The relationship between a room in the original plan and in the reduced plan is the same as the relationship between the whole plans.
d. 1 inch represents 2 ft
6. Answer is (C) since its diameters have a ratio of 2 to 1 from the original to the image.
7. Angle measures do not change in each case.
Side lengths and the perimeter are:
 - a. 2 times as long
 - b. 1.5 times as long
 - c. $\frac{1}{2}$ times as long
 - d. $\frac{3}{4}$ times as long

Connections

8. perimeter = 50 km;
area = 131.25 km²
9. perimeter = 42 m;
area = 75 m²
10. perimeter = 43 mm;
area = 75 mm²
11. perimeter = 67.8 cm;
area = 125 cm²
12. (**Note:** Labsheet 1ACE: Exercises 3, 4, 12 has left-handed and right-handed versions of this question.)
 - a. The side lengths of the image hexagon are 2 times as long as the side lengths of the original hexagon.
 - b. The angles of the two hexagons are the same.

- c. The area of the image hexagon is 4 times as big as the area of the original hexagon.
- d. The perimeter of the image hexagon is 2 times as long as the perimeter of the original hexagon.

13. a. 30 b. 96 c. 96
 d. 105 e. 300 f. 300

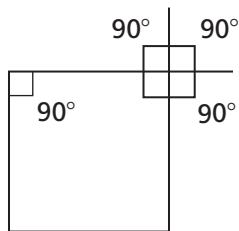
14. B

15. G

16. C

17. H

18. a. 90° , 90° , and 90° ;
 The supplementary angle of 90° is 90° .
 All angles are right angles;
 All 90° .

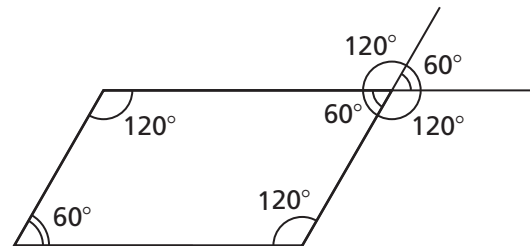


- b. 60° , 120° , and 60° (clockwise);

The supplementary angle of 120° is 60° , and the supplementary angle of 60° is 120° .

60° is an acute angle, and 120° is an obtuse angle;

60° , 120° , and 60° (clockwise)



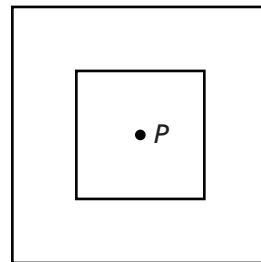
19. a. All the statements are accurate.
 Sample explanation: The first statement gives the difference between the costs of the two pairs of shoes. The second statement uses a percent comparison. The last statement uses a fraction to compare the two costs. Even though the statements are different, they are each an accurate way to compare items.
- b. One can use similar statements in comparing sizes of shapes (the length is 300% larger than the original; the length is $\frac{1}{3}$ the length of the original, etc.).
- c. Answers will vary. Sample answer: The second and third statements are most appropriate because they compare the two quantities in terms of percents and scale factors.

Extensions

20. a. The width and height would be 2 times as large as the first picture.
 width = 6 ft
 height = 4 ft
 area = 24 ft^2
- b. The width and height would be 1.5 times as large as the first picture.
 width = 4.5 ft
 height = 3 ft
 area = 13.5 ft^2
21. To use her picture frame for the picture, Amy will have this picture enlarged to 200%.
22. Note that there are two possible interpretations of this Exercise. Most students will use the knot closer to the anchor point to trace the original figure. Some students may use the knot closer to the pencil. Both answers are given. Answers for the knot closer to the anchor point are listed first.

- a. The shapes are similar to each other.
 - b. The lengths in the image figure are 3 times as long as the lengths in the original figure. (Or the lengths in the image figure are 1.5 times as long as the lengths in the original figure.)
 - c. The areas in the image figure are 9 times as big as the areas in the original figure. (Or the areas in the image figure are 2.25 times as long as the areas in the original figure. Students may estimate and say that the areas in the image are a little more than twice those in the original.)
 - d. Each point on the image is 3 times as far from P as its corresponding point on the original figure. (Or each point on the image is 1.5 times as far from P as its corresponding point on the original figure.)
- 23. a.** The size of the image would still be the same as in the case when the anchor point is outside. However, in this case, the image figure would enclose the original figure.

- b. Sizes of sides and perimeters would be 2 times as long as the original figure. Angle measures would not change. Area would be 4 times as big as the area of the original figure. The distance each image point is from P is twice the distance its corresponding point is from P .
- c. Answers will vary. One possibility is shown.



- 24. a.** The lengths are 1.5 times as long as the original figure. Angle measures do not change. The perimeter is 1.5 times as large as the original figure. Area would be $1.5 \times 1.5 = 2.25$ times as large as the original figure.