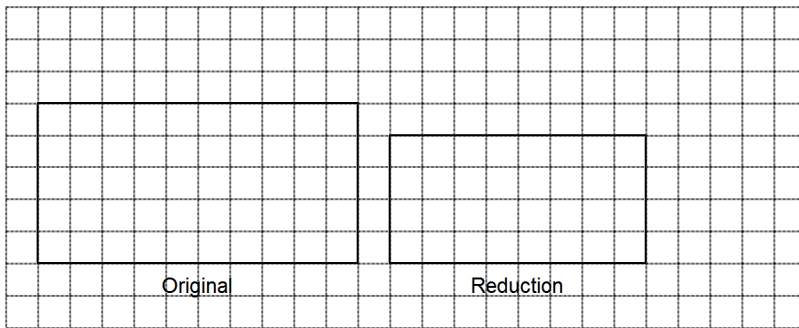# Math 9

Short Answer

1. The side length of an equilateral triangle is 8 cm.
    A scale diagram of the triangle has side length 24 cm.
    Determine the scale factor of the diagram.

2. A wheel has diameter 65 cm.
    Determine the diameter on a scale diagram if the scale factor is 0.06.

3. Determine the scale factor for this reduction.
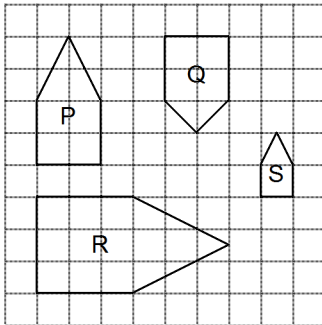

Original   Reduction

4. A soccer pitch is about 70 m long. A model of the soccer pitch is made using a scale of 1:60. Determine the
    length of the model to the nearest centimetre, if necessary.

5. Calculate the value of x in this proportion: $\dfrac{x}{2.5} = \dfrac{7.5}{10}$

6. Identify similar quadrilaterals.
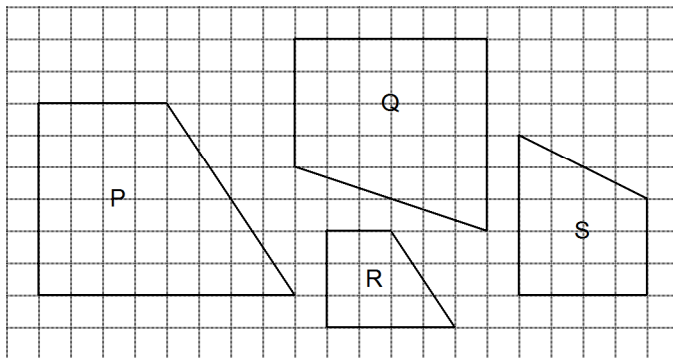
7. Identify similar parallelograms.
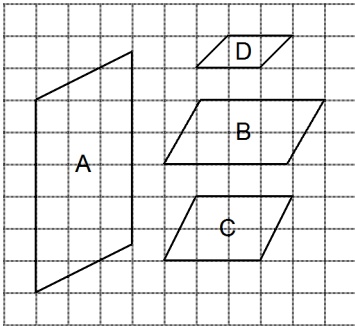
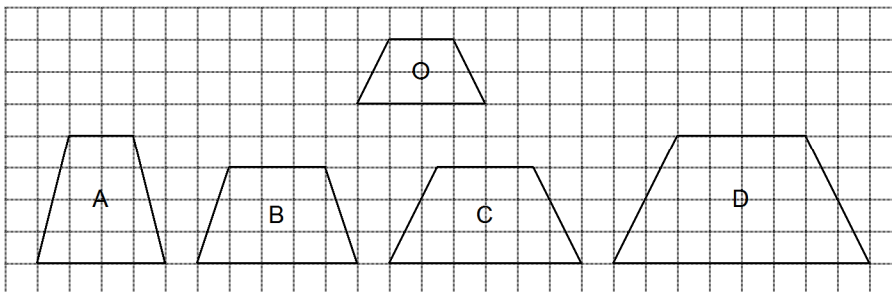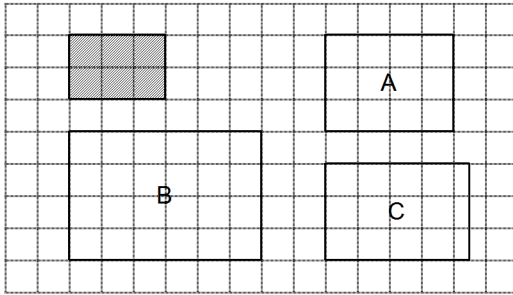
8. Identify similar pentagons.

9. Identify similar rectangles with these dimensions:
   a) 10 cm by 15 cm
   b) 19 cm by 28 cm
   c) 16 cm by 24 cm
   d) 12 cm by 18 cm

10. Which of trapezoids A, B, C, and D are scale diagrams of trapezoid O?

11. Which of rectangles A, B, and C are scale diagrams of the shaded rectangle?
    For each scale diagram you identify, state the scale factor.

12. Determine the scale factor of this reduction as a fraction and as a decimal.
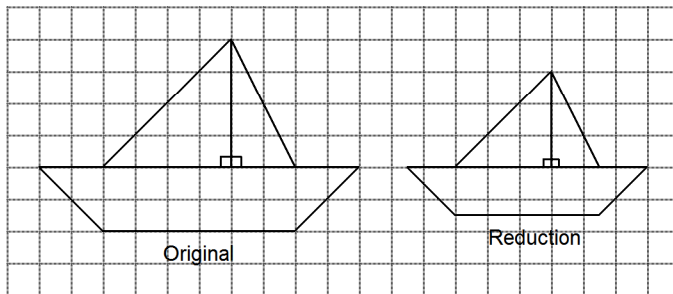
13. Which two triangles have pairs of corresponding lengths that are proportional?
    Identify the scale factor for the reduction.

14. These quadrilaterals are similar. Determine the value of x.

15. A rectangular garden measures 15 m by 9 m.
    A similar rectangular garden is 9 m long.
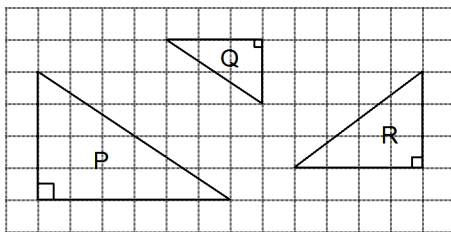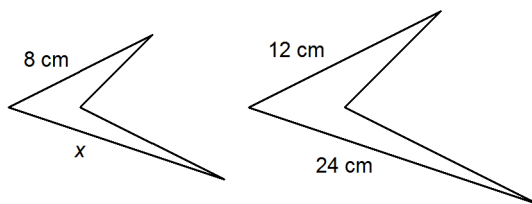   Calculate the width of the garden.

16. These quadrilaterals are similar. Determine the values of x and $y°$.
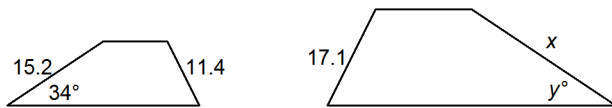
Problem

17. A scale diagram of a hotel room is shown below. The length of the room is 6 m.
    a) Determine the scale factor. Explain what it means.
    b) What are the actual dimensions of the bed, couch, and desk?
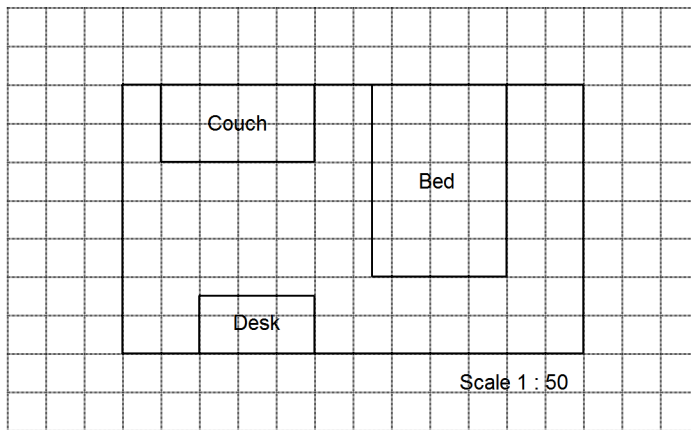
18. These three rectangles are similar.
    a) Determine the values of x and y.
    b) Griswald draws another similar rectangle with width 57.6 cm. What is its length?

Math 9
Answer Section

SHORT ANSWER

1. ANS:
   3

   PTS: 1 DIF: Easy REF: 7.1 Scale Diagrams and Enlargements
   LOC: 9.SS4 TOP: Shape and Space (Transformations)
   KEY: Procedural Knowledge
2. ANS:
   3.9 cm

   PTS: 1 DIF: Easy REF: 7.2 Scale Diagrams and Reductions
   LOC: 9.SS4 TOP: Shape and Space (Transformations)
   KEY: Procedural Knowledge
3. ANS:
   $\frac{4}{5}$

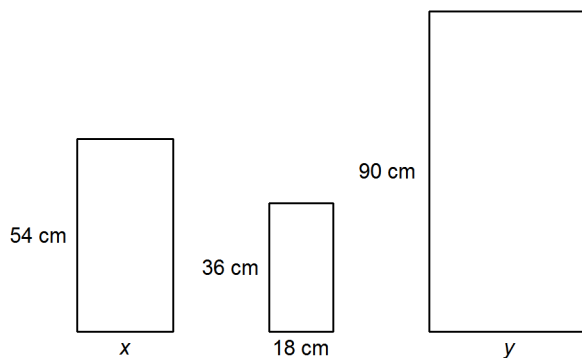   PTS: 1 DIF: Easy REF: 7.2 Scale Diagrams and Reductions
   LOC: 9.SS4 TOP: Shape and Space (Transformations)
   KEY: Procedural Knowledge
4. ANS:
   117 cm

   PTS: 1 DIF: Moderate REF: 7.2 Scale Diagrams and Reductions
   LOC: 9.SS4 TOP: Shape and Space (Transformations)
   KEY: Procedural Knowledge
5. ANS:
   1.875

   PTS: 1 DIF: Easy REF: 7.3 Similar Polygons
   LOC: 9.SS3 TOP: Shape and Space (3-D Objects and 2-D Shapes)
   KEY: Procedural Knowledge
6. ANS:
   P and R

   PTS: 1 DIF: Easy REF: 7.3 Similar Polygons
   LOC: 9.SS3 TOP: Shape and Space (3-D Objects and 2-D Shapes)
   KEY: Procedural Knowledge

7. ANS:
All of the above

PTS: 1   DIF: Easy   REF: 7.3 Similar Polygons
LOC: 9.SS3   TOP: Shape and Space (3-D Objects and 2-D Shapes)
KEY: Procedural Knowledge

8. ANS:
P, R, and S

PTS: 1   DIF: Easy   REF: 7.3 Similar Polygons
LOC: 9.SS3   TOP: Shape and Space (3-D Objects and 2-D Shapes)
KEY: Procedural Knowledge

9. ANS:
a, c, and d

PTS: 1   DIF: Moderate   REF: 7.3 Similar Polygons
LOC: 9.SS3   TOP: Shape and Space (3-D Objects and 2-D Shapes)
KEY: Procedural Knowledge

10. ANS:
Trapezoids C and D

PTS: 1   DIF: Moderate   REF: 7.1 Scale Diagrams and Enlargements
LOC: 9.SS4   TOP: Shape and Space (Transformations)
KEY: Procedural Knowledge

11. ANS:
Rectangle B; scale factor is 2.
Rectangle C; scale factor is 1.5.

PTS: 1   DIF: Moderate   REF: 7.1 Scale Diagrams and Enlargements
LOC: 9.SS4   TOP: Shape and Space (Transformations)
KEY: Procedural Knowledge

12. ANS:
$\dfrac{3}{4} = 0.75$

PTS: 1   DIF: Moderate   REF: 7.2 Scale Diagrams and Reductions
LOC: 9.SS4   TOP: Shape and Space (Transformations)
KEY: Procedural Knowledge

13. ANS:

Triangle Q is a reduction of triangle P; the scale factor for the reduction is $\dfrac{1}{2}$.

PTS: 1   DIF: Moderate   REF: 7.2 Scale Diagrams and Reductions
LOC: 9.SS4   TOP: Shape and Space (Transformations)
KEY: Procedural Knowledge

14. ANS:
    $x = 16$ cm

    PTS: 1   DIF: Easy   REF: 7.3 Similar Polygons
    LOC: 9.SS3   TOP: Shape and Space (3-D Objects and 2-D Shapes)
    KEY: Procedural Knowledge
15. ANS:
    The width is 5.4 m.

    PTS: 1   DIF: Moderate   REF: 7.3 Similar Polygons
    LOC: 9.SS3   TOP: Shape and Space (3-D Objects and 2-D Shapes)
    KEY: Procedural Knowledge
16. ANS:
    $x = 22.8$
    $y° = 34°$

    PTS: 1   DIF: Moderate   REF: 7.3 Similar Polygons
    LOC: 9.SS3   TOP: Shape and Space (3-D Objects and 2-D Shapes)
    KEY: Conceptual Understanding | Procedural Knowledge

PROBLEM

17. ANS:

a) The scale factor is $\frac{1}{50}$. This means that 1 unit on the diagram represents 50 cm on the room.

b) To find the actual dimensions, multiply each measure on the scale diagram by 50 cm.

Measure the length and width of the bed on the scale diagram.
The length is 5 units.
The width is 3.5 units.
The actual length of the bed is: 5×50 cm $= 250$ cm
The actual width of the bed is: 3.5×50 cm $= 175$ cm

Measure the length and width of the couch on the scale diagram.
The length is 4 units.
The width is 2 units.
The actual length of the couch is: 4×50 cm $= 200$ cm
The actual width of the couch is: 2×50 cm $= 100$ cm

Measure the length and width of the desk on the scale diagram.
The length is 3 units.
The width is 1.5 units.
The actual length of the desk is: 3×50 cm $= 150$ cm
The actual width of the desk is: 1.5×50 cm $= 75$ cm

PTS: 1   DIF: Difficult   REF: 7.2 Scale Diagrams and Reductions
LOC: 9.SS4   TOP: Shape and Space (Transformations)
KEY: Problem-Solving Skills | Communication

18. ANS:

a)

Solve for x.

$$\frac{x}{18} = \frac{54}{36}$$

$$18 \times \frac{x}{18} = 18 \times \frac{54}{36}$$

$$x = \frac{18 \times 54}{36}$$

$$x = 27$$

So, $x = 27$ cm.

Solve for y.

$$\frac{y}{18} = \frac{90}{36}$$

$$18 \times \frac{y}{18} = 18 \times \frac{90}{36}$$

$$y = \frac{18 \times 90}{36}$$

$$y = 45$$

So, $y = 45$ cm.

b) Let z represent the length.

$$\frac{z}{36} = \frac{57.6}{18}$$

$$36 \times \frac{z}{36} = 36 \times \frac{57.6}{18}$$

$$z = \frac{36 \times 57.6}{18}$$

$$z = 115.2$$

The length is 115.2 cm.

PTS: 1   DIF: Moderate   REF: 7.3 Similar Polygons
LOC: 9.SS3   TOP: Shape and Space (3-D Objects and 2-D Shapes)
KEY: Problem-Solving Skills | Procedural Knowledge