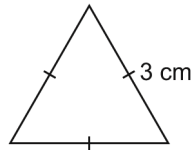**Master 7.23** # Extra Practice 1

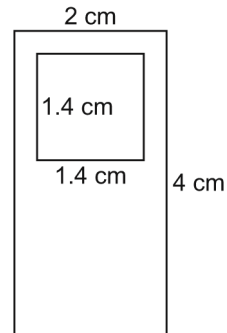**Lesson 7.1 Scale Diagrams and Enlargements**

1. The actual length of a needle is 6 cm. The length of the needle on a scale diagram is 9 cm.
   What is the scale factor of the diagram?

2. Scale diagrams of different circles are to be drawn. The diameter of each circle, and the scale
   factor are given. Determine the diameter of each circle on its scale diagram.
   Write the answers.

	Diameter of original circle	**Scale factor**	**Diameter of scale diagram**
a)	8 cm	6	
b)	40 mm	$\frac{15}{4}$	
c)	3.5 cm	5.8	
d)	0.6 mm	20.5	

3. Draw an enlargement of an equilateral
   triangle with side length 3 cm.
   Use a scale factor of $\frac{5}{3}$.

   3 cm

4. Draw a scale diagram of this model of an mp3 player.
   Use a scale factor of 2.5.

   2 cm
   1.4 cm
   1.4 cm
   4 cm

5. The dimensions of a photo of a mountain bike are 15 cm by 12 cm.
   An enlargement is to be made for a poster with dimensions 4.0 m by 3.2 m.
   What is the scale factor of the poster to the nearest tenth?

Master 7.24   **Extra Practice 2**

Lesson 7.2 Scale Diagrams and Reductions

1. Here is scale diagram of a picnic table.

    The actual length of the picnic table is 180 cm with legs 60 cm.
    What is the scale factor for this diagram?

2. A rectangular playground has dimensions 24 m by 16 m.
    Draw a scale diagram of this playground with a scale factor of $\dfrac{1}{200}$.

3. A reduction of each object is to be drawn with the given scale factor.
    Determine the corresponding length in centimetres on the scale diagram.

    a) Fishing rod length 280 cm, scale factor $\dfrac{1}{50}$

    b) Boogie board length 1.5 m, scale factor 0.05
    c) Jogging route 10 km, scale factor 0.000 02

4. The scale diagram below has a scale factor of 0.25.
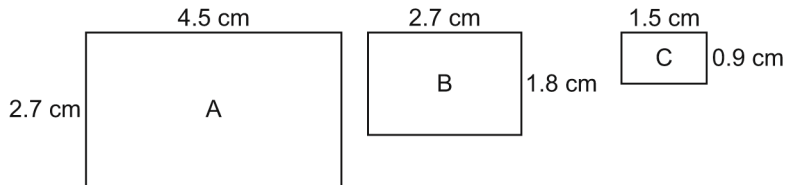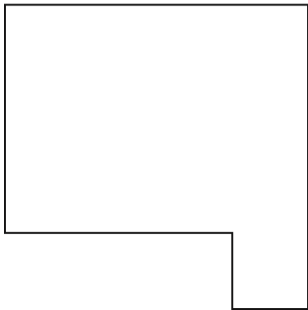   What are the dimensions of the actual rectangle?

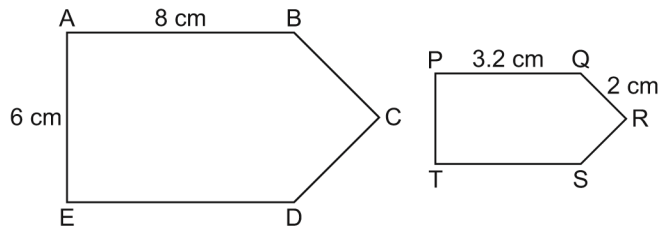**Master 7.25**　　**Extra Practice 3**

Lesson 7.3 Similar Polygons

1. Which rectangles are similar? Give reasons for your answer.

4.5 cm　　　2.7 cm　　　1.5 cm

2.7 cm　　A　　　B　1.8 cm　　C　0.9 cm

2. For the given polygon draw a similar larger polygon and a similar smaller polygon. Write the scale factor for each diagram.

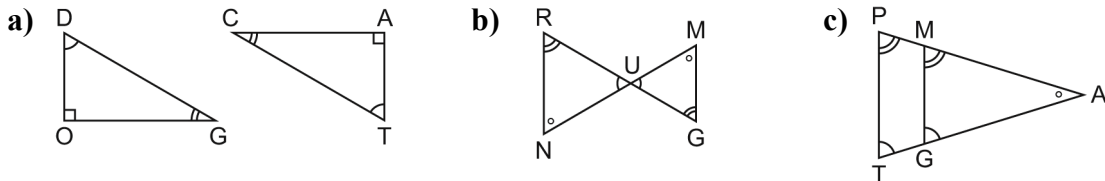**3.** These polygons are similar. Determine each length.
　a) PT
　b) BC

A　8 cm　B

6 cm　　C

E　　　D

P　3.2 cm　Q

2 cm

R

T　　　S

4. Which statements are true? Justify your answers.
　a) All regular octagons are similar.
　b) All quadrilaterals are similar.
　c) All circles are similar.
　d) All pentagons are similar.
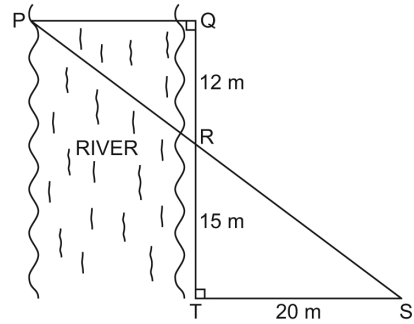
Name _____ Date _____

Extra Practice 4

Lesson 7.4 Similar Triangles

1. Identify the similar triangles in the following diagrams.
    Equal angles are marked on the diagrams.
    a)

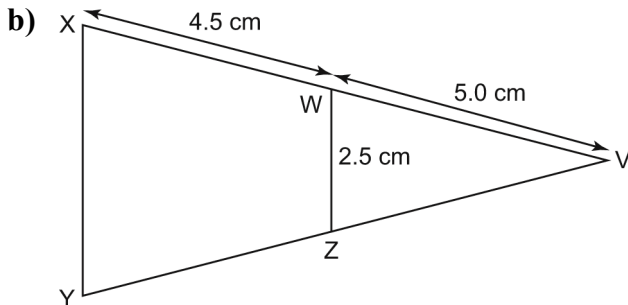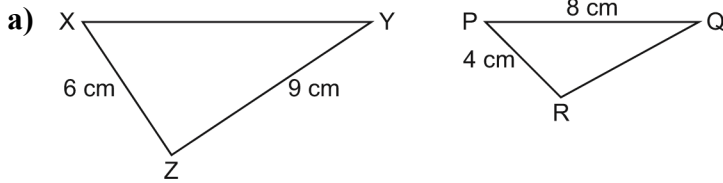   b)

    c)

2. A person who is 1.9 m tall has a shadow that is 1.5 m long.
    At the same time, a flagpole has a shadow that is 8 m long.
    Determine the height of the flagpole to the nearest tenth of a metre.
    Draw a diagram.

3. A surveyor wants to determine the width of a river.
    She measures distances and angles on land,
    and sketches this diagram.
    What is the width of the river, PQ?

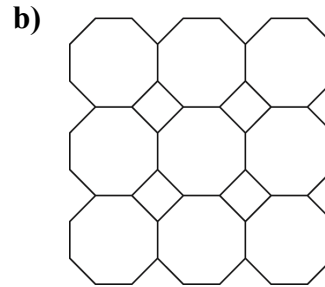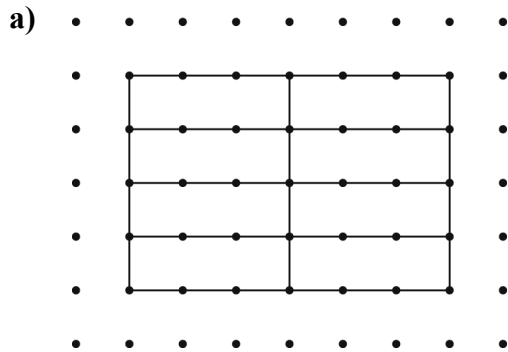4. Determine the length of XY in each pair of similar triangles.
    a)

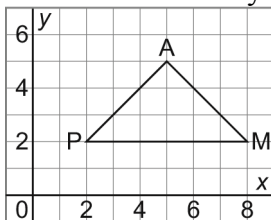
    b)

Master 7.27   **Extra Practice 5**

Lesson 7.5 Reflections and Line Symmetry

1. Draw in the lines of symmetry in each design.

a)

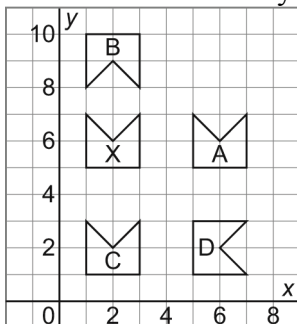**b)**

2. Draw the image of ΔPAM after each reflection below.
Write the coordinates of the larger shape formed by ΔPAM and its reflection images.
Draw the lines of symmetry of the larger shape.

a) Reflect ΔPAM in the horizontal line passing through 2 on the *y*-axis.
b) Reflect ΔPAM in the vertical line passing through 5 on the *x*-axis.
c) Reflect ΔPAM in the oblique line passing through the points (2, 2) and (5, 5).

3. Identify the shapes that are related to the shape X by a line of reflection.
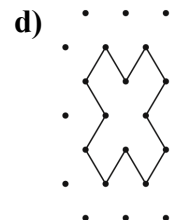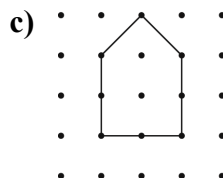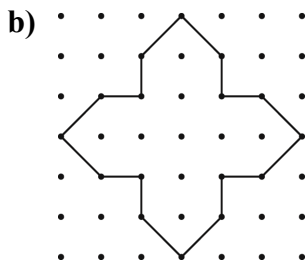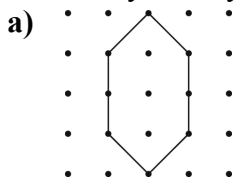Describe the line of symmetry in each case.

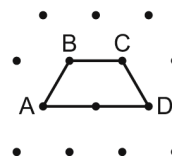**Master 7.28**   # Extra Practice 6

Lesson 7.6 Reflections and Line Symmetry

1. Which polygons have rotational symmetry? State the order of rotation and the angle of rotation symmetry for each.

    a)   **b)**   **c)**   **d)**

2. Draw the rotation image for each rotation of quadrilateral ABCD.
    Rotate quadrilateral ABCD clockwise about vertex D by:
    a) 60°   **b)** 120°   **c)** 180°
    d) 240°   **e)** 300°
    Consider the larger shape formed by quadrilateral ABCD and
    these rotation images. Describe the symmetry of this shape.

3. What is the order of rotation and the angle of rotation symmetry, if any, for:
    a) an equilateral triangle   **b)** a regular polygon with 9 sides
    c) a kite that is not a rhombus   **d)** the plus sign +

4. Plot the kite FISH on a coordinate grid.
    The vertices of FISH are F(3, 4), I(5, 2), S(3, 1), H(1, 2).
    Rotate the kite FISH:
    a) 90° clockwise about vertex F
    b) 180° about vertex F
    c) 270° clockwise about vertex F
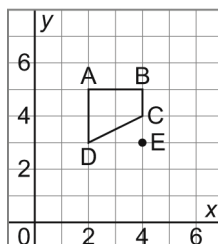   Draw each rotation image.
    Look at the shape formed by the kite and its rotation images.
    Write the coordinates of this shape.
    Describe any rotational symmetry in this shape.

5. Draw the rotation image for each
    transformation of quadrilateral ABCD.
    a) 180° about vertex B
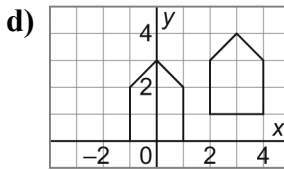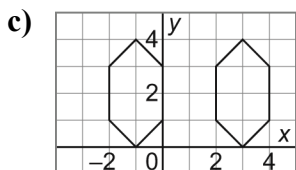   **b)** 90° clockwise about vertex A
    c) 90° counterclockwise about point E

Master 7.29　　**Extra Practice 7**

Lesson 7.7 Identifying Types of Symmetry on the Cartesian Plane

1. For each pair of shapes, determine whether they are related by line symmetry, by rotational symmetry, by both line and rotational symmetry, or by neither. Describe the symmetry, if any.

   a)

   b)

   c)

   d)

2. Which of the rectangles A, B, C, D is related to rectangle X:
   a) by rotational symmetry about the origin?
   b) by rotational symmetry about one of the vertices of rectangle X?
   c) by line symmetry?

3. Identify and describe the types of symmetry in the petal shapes.
   a)　　　　**b)**　　　　**c)**　　　　**d)**　　　　**e)**

4. Draw the image of quadrilateral WXYZ after each transformation. Write the coordinates of each shape formed by quadrilateral WXYZ and its image. Describe the symmetry in each of these shapes.
   a) reflection in the *x*-axis
   b) rotation 90° clockwise about the origin
   c) rotation 90° clockwise about the point (1, 0)
   d) translation 1 square right and 1 square down

Master 7.30 # Extra Practice Sample Answers

Extra Practice 1 – Master 7.23

Lesson 7.1
1. 1.5

2. **a)** 48 cm **b)** 150 mm
c) 20.3 cm **d)** 12.3 mm

3.

5 cm

4.

5 cm
3.5 cm
3.5 cm | 10 cm

5. About 26.7

Extra Practice 2 – Master 7.24

Lesson 7.2
1. $\dfrac{1}{30}$

2.

12 cm
8 cm

3. **a)** 5.6 cm **b)** 7.5 cm
c) 20 cm

4. 32 cm by 8 cm

Extra Practice 3 – Master 7.25

Lesson 7.3
1. A and C because $\dfrac{4.5}{1.5} = \dfrac{2.7}{0.9}$

2. 1.5 0.5

6 cm
1.5 cm
2 cm
4.5 cm
1.5 cm
2 cm
0.5 cm
6 cm
4.5 cm
1.5 cm
0.5 cm
1.5 cm

3. **a)** 2.4 cm **b)** 5 cm

4. a and c

Extra Practice 4 – Master 7.26

Lesson 7.4
1. **a)** ΔDOG ~ ΔTAC
b) ΔRUN ~ ΔGUM
c) ΔPAT ~ ΔMAG

2. 10.1 m

x
1.9 m
1.5 m
8 m

3. 16 m

4. **a)** 12 cm **b)** 4.75 cm

Master 7.31

Extra Practice Sample Answers

Extra Practice 5 – Master 7.27

Lesson 7.5

1. a)

b)

2. a)

b)

c)

3. A: reflected in vertical line passing through 4 on the *x*-axis
B: reflected in horizontal line passing through 7.5 on the *y*-axis
C: not related to X by line symmetry
D: reflected in oblique line passing through (0, 0) and (8, 8)

Extra Practice 6 – Master 7.28

Lesson 7.6

1. a) 2, 180°   **b)** 4, 90°
   c) no rotational symmetry   **d)** 2, 180°

2.

The larger shape has rotational symmetry of order 6 about D.

3. a) 3, 120°   **b)** 9, 40°
   c) no rotational symmetry   **d)** 4, 90°

4. (1, 2), (0, 4), (1, 6), (3, 7), (5, 6), (6, 4), (5, 2), (3, 1)
Rotational symmetry of order 4 about F

5.

Master 7.32

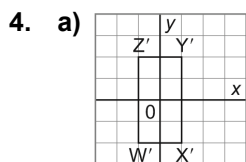# Extra Practice and Activating Prior Knowledge Sample Answers

Extra Practice 7 – Master 7.29
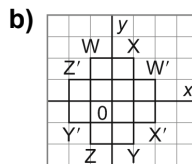
Lesson 7.7

1. **a)** The y-axis is a line of symmetry.
   b) Rotational symmetry about the point $(-1, 0)$ with a 90° clockwise rotation
   c) The vertical line passing through 1 on the x-axis is a line of symmetry; rotational symmetry about the point $(1, 2)$ with a 180° rotation.
   d) No symmetry

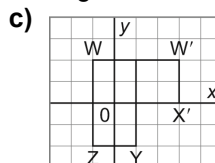2. **a)** B   **b)** C   **c)** A

3. **a)** 3 lines of symmetry, rotational symmetry of order 3
   b) 4 lines of symmetry, rotational symmetry of order 4
   c) 6 lines of symmetry, rotational symmetry of order 6
   d) No symmetry
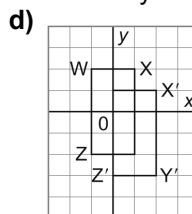   **e)** 1 line of symmetry, no rotational symmetry

4. **a)**

   $W'(-1, -2)$, $X'(1, -2)$, $Y'(1, 2)$, $Z'(-1, 2)$
   The x- and y-axes are lines of symmetry; rotational symmetry of order 2 about the origin.

b)

$W(-1, 2)$, $X(1, 2)$, $W'(2, 1)$, $X'(2, -1)$, $Y(1, -2)$, $Z(-1, -2)$, $Y'(-2, -1)$, $Z'(-2, 1)$
The x- and y-axes are lines of symmetry; the line through $(1, 1)$ and $(-1, -1)$ is a line of symmetry; the line through $(-1, 1)$ and $(1, -1)$ is a line of symmetry; rotational symmetry of order 4 about the origin.
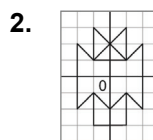
c)

$W(-1, 2)$, $W'(3, 2)$, $X'(3, 0)$, $(1, 0)$, $Y(1, -2)$, $Z(-1, -2)$
The line through $(1, 0)$ and $(-1, 2)$ is a line of symmetry, no rotational symmetry.

d)

$W(-1, 2)$, $X(1, 2)$, $X'(2, 1)$, $Y'(2, -3)$, $Z'(0, -3)$, $Z(-1, -2)$
Rotational symmetry of order 2 about the point $(0.5, -0.5)$; no lines of symmetry

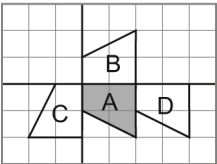## Activating Prior Knowledge – Master 7.33

1. **a)** Reflection in the horizontal line through 1 on the y-axis
   b) Rotation 180° about $(0, 1)$
   c) Translation 2 units up
   d) Reflection in the horizontal line through 2 on the y-axis
   e) Rotation 180° about $(0, 2)$

2.

3. **a)** 4   **b)** 2   **c)** 1
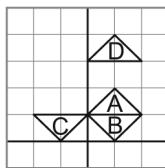
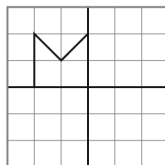**Master 7.33**   **Activating Prior Knowledge**

Describing Transformations   **Quick Review**

Under any transformation, the original shape and its image are congruent.
Here are 3 transformations of Shape A.

Shape A is reflected in the horizontal line to get Shape B.
Shape A is rotated 90° clockwise about the origin to get Shape C.
Shape A is translated 2 units right to get Shape D.

Check
1. Identify each transformation.
   a) Shape B is the image of Shape A.
   b) Shape C is the image of Shape A.
   c) Shape D is the image of Shape A.
   d) Shape D is the image of Shape B.
   e) Shape D is the image of Shape C.

2. On grid paper, copy this diagram.
   Draw the image of the original shape after
   each transformation to create a design.
   a) a reflection in the *y*-axis
   b) a reflection in the *x*-axis
   c) a rotation of 180° about the origin
   d) a translation R1 U1
   e) a translation R1 D3

3. How many lines of symmetry does each shape or diagram have?
   a)   **b)**   **c)**