Chapters 1-4 Review

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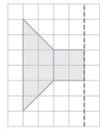
Chapter 1 Symmetry and Surface Area

1. Sketch each shape showing its line(s) of symmetry. Describe the lines of symmetry and the type of symmetry each shape has.

a)

b)

2. Describe two ways you could complete the drawing if the dashed line represents a line of symmetry. Complete the drawing.



3. Create a design within a circle that shows both line and rotation symmetry.

a) How many lines of symmetry are in your design? Describe them.

b) What is the order of rotation in your design?

c) Give the angle of rotation in both degrees and fractions of a revotation.

4. Draw a diagram of a square cake and a round cake. Select any dimensions you like as long as the side of the square cake is the same length as the diameter of the round cake.

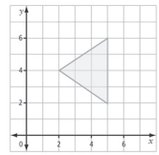
a) Find the surface area of each cake. Use all sides except the bottom.

b) Cut each cake into four equal pieces. If the pieces of cake are separated from each other, by what percent does the surface area of each cake increase? Again, do not consider the bottom.

5. Reproduce the triangle on a coordinate grid.

a) Complete a diagram that has rotation symmetry of order 4 about the origin.

- Label the vertices on the original triangle.
- Show the coordinates of their images after each rotation.



b) Start again, this time using line symmetry to make a new diagram. Use the *y*-axis and then the *x*-axis as lines of symmetry.

6. Four cubes, each with side lengths of 25 cm, are joined as shown.

a) Find the surface area of the solid that is formed.

b) If the four cubes are rearranged as shown, how does the surface area change?

166 MHR • Chapter 4

Chapter 2 Rational Numbers

7. Write the following rational numbers in ascending order.

$0.\overline{6}$ -0.9 $-\frac{4}{5}$ 2.7 $-2\frac{3}{4}$ $-\frac{2}{3}$

8. Identify a fraction between -6.3 and -6.4.

9. Estimate, then calculate.

a) $-2.52 + 1.84$

b) $-2.4 \times (-1.5)$

c) $-4.37 \div (-0.95)$

d) $0.76 + (-1.83)$

e) $8.48 - 10.51$

f) $-5.3(4.2)$

g) $-2.31 - (-5.72)$

h) $-5.5 \div (-5.5)$

10. Estimate, then calculate.

a) $1\frac{1}{10} - \left(-1\frac{1}{10}\right)$

b) $3\frac{3}{5} \div \left(-3\frac{3}{8}\right)$

c) $-1\frac{1}{2} - \frac{1}{12}$

d) $-\frac{1}{6} + \left(-\frac{1}{8}\right)$

e) $\frac{1}{10} \times \left(-\frac{3}{7}\right)$

f) $\frac{2}{3} \div \frac{4}{5}$

g) $-4\frac{1}{2} + 2\frac{5}{9}$

h) $-2\frac{1}{2}\left(-2\frac{1}{2}\right)$

11. Estimate and then calculate the side length of each square from its area. If necessary, round your answer to the nearest hundredth of a unit.

a) 2.56 cm^2

b) 0.01 km^2

c) 0.048 mm^2

d) 1.02 km^2

12. Mary is sewing a square quilt. If the area of her quilt is 2.89 m^2, what is its perimeter?

Chapter 3 Powers and Exponents

13. Write $4^2 \times (4^3)^5$ as a single power.

14. Evaluate the expression $(-6)^0 + 2^3 \div (7 - 5)^2$.

15. Write $\frac{(-4)^2(-4)^{10}}{(-4)^3}$ as a single power and then evaluate.

16. Write $(3 \times 7)^4$ as repeated multiplication without any exponents and as a product of two powers.

17. A population of 50 bacteria doubles in number every hour. The formula $N = 50(2)^t$ determines the number, N, of bacteria that are present after t hours. How many bacteria will there be after each number of hours?

a) 5 h

b) 9 h

Chapters 1–4 Review • MHR 167

***MathLinks 9*, pages 166–168**

Suggested Timing

60–75 minutes

Materials

- grid paper
- ruler
- calculator

Blackline Masters

Master 7 Isometric Dot Paper
Master 8 Centimetre Grid Paper

Planning Notes

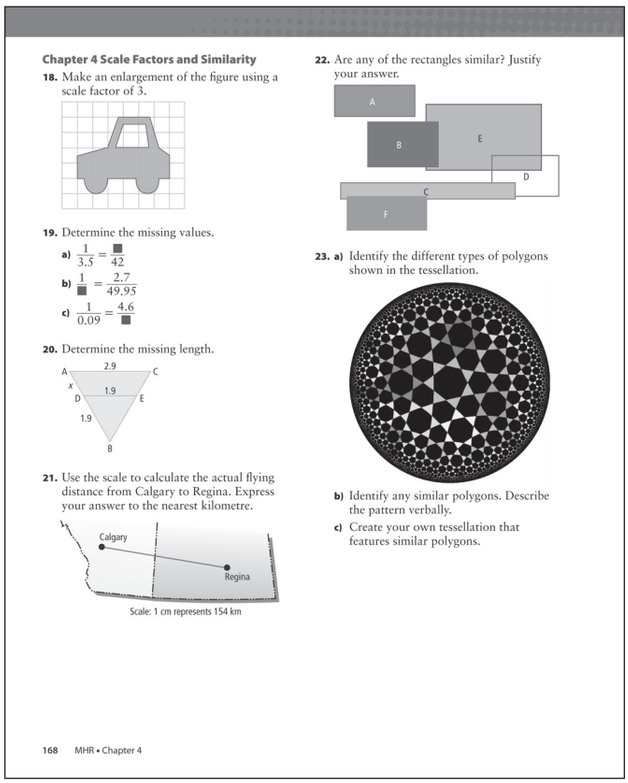
Provide students with **Master 8 Centimetre Grid Paper**.

Consider having students work individually to complete the review, then in pairs to compare the solutions. Alternatively, assign the Chapters 1–4 Review to reinforce the concepts, skills, and processes learned so far. If students encounter difficulties, have them discuss strategies with a partner. Encourage them to refer to their notes in each chapter Foldable, and then to the specific section in the student resource and/or their notebook. Once they have found a suitable strategy, have students include it in the appropriate section of the respective chapter Foldable.

These are the minimum questions that will meet the curriculum requirements: #1–3, 5–18, and 20–22.

Study Guide

Question(s)	Section(s)	Refer to	The student can …
#1a), b)	1.1	Example 1	✓ classify 2-D shapes or designs according to the number of lines of symmetry ✓ identify the line(s) of symmetry for a 2-D shape or design
#2	1.1	Example 2	✓ complete a shape or design given one half of the shape and a line of symmetry
#3	1.1 1.2	Example 1 Example 1	✓ create a design that demonstrates line symmetry ✓ create designs with rotation symmetry
#4, 6	1.3	Examples 1, 2	✓ determine the area of overlap in composite 3-D objects ✓ find the surface area for composite 3-D objects ✓ solve problems involving surface area
#5	1.2	Example 2	✓ tell if 2-D shapes and designs have rotation symmetry ✓ give the order of rotation and angle of rotation for various shapes ✓ identify the transformations in shapes and designs involving line or rotation symmetry
#7	2.1	Examples 1, 2	✓ compare and order rational numbers
#8	2.1	Example 3	✓ identify a rational number between two given rational numbers
#9	2.2	Examples 1, 2	✓ perform operations on rational numbers in decimal form
#10	2.3	Examples 1, 2	✓ perform operations on rational numbers in fraction form
#11	2.4	Examples 2, 3	✓ determine an approximate square root of a non-perfect square rational number
#12	2.4	Example 2	✓ determine the square root of a perfect square rational number
#13	3.2	Examples 1, 3	✓ explain the exponent laws for multiplying or dividing powers with the same base ✓ explain the exponent law for raising a power to an exponent
#14	3.2 3.3	Example 4 Example 2	✓ explain the exponent law for powers with an exponent of zero ✓ evaluate powers with integral bases (excluding base 0) and whole number exponents ✓ use the order of operations on expressions with powers
#15	3.1 3.2	Example 3 Examples 1, 2	✓ evaluate powers that include parentheses ✓ explain the exponent laws for multiplying or dividing powers with the same base
#16	3.1 3.2	Example 2 Example 3	✓ describe how powers represent repeated multiplication ✓ explain the exponent law for raising a product to an exponent
#17	3.4	Example 2	✓ apply the laws of exponents ✓ solve problems by applying the order of operations
#18	4.1	Example 1	✓ draw enlargements and reductions to scale
#19, 21	4.2	Examples 1, 2	✓ determine the scale factor for scale diagrams
#20	4.3	Example 2	✓ solve problems using the properties of similar triangles
#22, 23	4.4	Example 1	✓ identify similar polygons and explain why they are similar



Chapter 4 Scale Factors and Similarity

18. Make an enlargement of the figure using a scale factor of 3.

19. Determine the missing values.

a) $\frac{1}{3.5} = \frac{\blacksquare}{42}$

b) $\frac{1}{\blacksquare} = \frac{2.7}{49.95}$

c) $\frac{1}{0.09} = \frac{4.6}{\blacksquare}$

20. Determine the missing length.

21. Use the scale to calculate the actual flying distance from Calgary to Regina. Express your answer to the nearest kilometre.

Scale: 1 cm represents 154 km

22. Are any of the rectangles similar? Justify your answer.

23. a) Identify the different types of polygons shown in the tessellation.

b) Identify any similar polygons. Describe the pattern verbally.

c) Create your own tessellation that features similar polygons.

Meeting Student Needs

- Allow students to complete the review using any combination of oral or written answers, including diagrams.
- For #4, students may use isometric dot paper as an alternative to grid paper. You may wish to provide **Master 7 Isometric Dot Paper**.

ELL

- Ensure that students understand the terms *bacteria* and *tessellation*.

Gifted and Enrichment

- Some students may already be familiar with the skills handled in this review. To provide enrichment and extra challenge for gifted students, go to www.mathlinks9.ca and follow the links.

Assessment	Supporting Learning
Assessment *for* Learning	
Chapters 1–4 Review The cumulative review provides an opportunity for students to assess themselves by completing selected questions pertaining to each chapter and checking their answers against the answers in the back of the student resource.	• Have students review their notes from each Foldable, the tests from each chapter and any challenges related to those chapters, identify items that they had problems with, and do the questions related to those items. Have students do at least one question that tests skills from each chapter. • Have students revisit any chapter section they are having difficulty with.
Assessment *as* Learning	
Math Learning Log Once students have completed the Chapters 1–4 Review, have them reflect on their progress and complete a journal entry for each statement: • I continue to have difficulty with … • Here's how I plan to address what I am having difficulty with …	• Encourage students to clear up any problems that they have had during the past four chapters. Work with them to provide the necessary coaching.