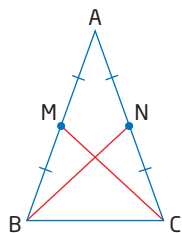


Chapter 3 Review

3.1 Investigate Properties of Triangles, pages 110–116

1. a) Define a median.
- b) List two additional properties of the medians of a triangle.
- c) Outline how you could use geometry software to show that the medians of all triangles have these properties.

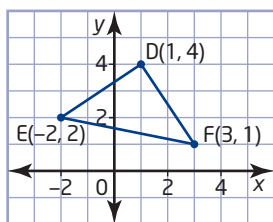
2. a) Use congruent triangles to show how the lengths of the medians to the two equal sides of an isosceles triangle are related.



- b) Describe how you can use geometry software to demonstrate that this relationship applies for all isosceles triangles.
3. a) Draw a right triangle with the shorter sides aligned with the coordinate axes. Then, draw the right bisectors of all three sides.
 - b) Show that the point of intersection of the right bisectors of the sides of any right triangle lies on the hypotenuse.
 - c) Describe how you can use geometry software to answer part b).

3.2 Verify Properties of Triangles, pages 117–127

4. a) Verify that $\triangle DEF$ is a right triangle.

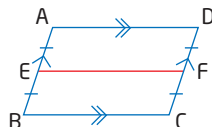


- b) Describe another method that you could use to answer part a).

5. a) Verify that the altitude from vertex J bisects side KL in the triangle with vertices $J(-5, 4)$, $K(1, 8)$, and $L(-1, -2)$.
- b) Classify $\triangle JKL$. Explain your reasoning.

3.3 Investigate Properties of Quadrilaterals, pages 128–136

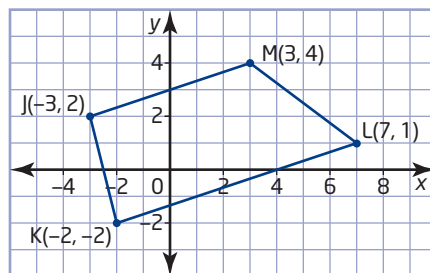
6. List two properties of the diagonals of each geometric shape.
 - a) square
 - b) parallelogram
 - c) kite
7. a) Show that the line segment joining the midpoints of opposite sides of any parallelogram bisects the area of the parallelogram.



- b) Describe another way to answer part a).

3.4 Verify Properties of Quadrilaterals, pages 137–144

8. Verify that quadrilateral JKLM is a trapezoid.



9. a) Classify the quadrilateral with vertices $T(2, 4)$, $U(8, 2)$, $V(7, -1)$, and $W(1, 1)$. Justify this classification.
- b) Verify a property of the diagonals of TUVW.

3.5 Properties of Circles, pages 145–151

10. a) Show that $A(-12, -5)$ and $B(12, 5)$ are endpoints of a diameter of the circle defined by $x^2 + y^2 = 169$.
- b) State the coordinates of another point, C , on the circle.
- c) Show that $\triangle ABC$ is a right triangle.
11. a) Verify that points $P(5, 7)$ and $Q(7, -5)$ lie on the circle with equation $x^2 + y^2 = 74$.
- b) Verify that the right bisector of the chord PQ passes through the centre of the circle.
12. Divers from scuba clubs in St. Catharines, Hamilton, and Oakville are working together to practise rescues in deep water. Describe how the clubs could find a practice site that is equidistant from the three towns.



Chapter Problem Wrap-Up

The golden ratio is also known as the divine proportion, the golden mean, and the golden section. Many people find that objects with proportions in the golden ratio are pleasing to the eye. For this reason, artists and architects sometimes use these proportions in their work.

- a) Research the golden ratio at a library or on the Internet. Is the golden ratio a rational number? Explain.
- b) Give an example of a regular geometric shape that involves the golden ratio. Describe how the golden ratio appears in this shape.
- c) Give an example of a natural object that may contain the golden ratio. Explain why researchers disagree on whether the golden ratio occurs frequently in nature.
- d) Some researchers argue that designers in ancient times used the golden ratio in buildings such as the Parthenon in Athens, Greece, and the Great Pyramid at Giza, Egypt. Do you think these claims are valid? Justify your answer.
- e) Measure a textbook. Are any of the dimensions related by the golden ratio? Explain.



Go to www.mcgrawhill.ca/links/principles10 and follow the links to learn more about the golden ratio.