# 2 Chapter Review

## *FREQUENTLY ASKED Questions*

**Q: How are angle properties in convex polygons developed using other angle properties?**

**A1:** If you draw a line through one of the vertices of a triangle parallel to one of the sides, you will create two transversals between two parallel lines. You can use the angle property that alternate interior angles are equal to show that the sum of the measures of the three interior angles of a triangle is 180°.

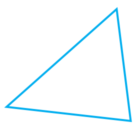
**Study *Aid***

- See Lesson 2.3.
- Try Chapter Review Questions 7 and 8.

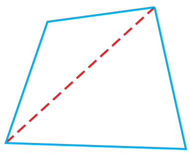
**A2:** The sum of the measures of the angles in any triangle is 180°. You can use this property to develop a relationship between the number of sides in a convex polygon and the sum of the measures of the interior angles of the polygon.

**Study *Aid***

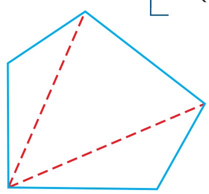
- See Lesson 2.4, Example 1.
- Try Chapter Review Questions 9 and 10.



$n = 3$, triangle
Sum of Interior Angles = (180°) 1



$n = 4$, quadrilateral
Sum of Interior Angles = (180°) 2



$n = 5$, pentagon
Sum of Interior Angles = (180°) 3

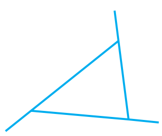
Using inductive reasoning, you can show that for any polygon with $n$ sides, the sum of the measures of the interior angles, $S(n)$, can be determined using the relationship:

$$S(n) = 180°(n - 2)$$

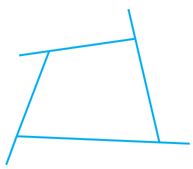
**A3:** When two angles share a vertex on a straight line, the angles are supplementary. You can use this angle property, along with the angle measure sum property for convex polygons, to develop a property about the exterior angles of a convex polygon. If you extend each side of a convex polygon, you will create a series of exterior angles.

**Study *Aid***

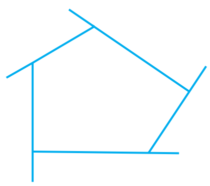
- See Lesson 2.4.
- Try Chapter Review Question 10.



$n = 3$, triangle
Sum of Interior Angles = (180°) 1
Sum of Exterior Angles:
3(180°) − (180°) 1 = 360°



$n = 4$, quadrilateral
Sum of Interior Angles = (180°) 2
Sum of Exterior Angles:
4(180°) − 2(180°) = 360°



$n = 5$, pentagon
Sum of Interior Angles = (180°) 3
Sum of Exterior Angles:
5(180°) − 3(180°) = 360°

Using inductive reasoning, you can show that for any polygon with $n$ sides, the sum of the exterior angles, $A(n)$, is determined using the relationship:

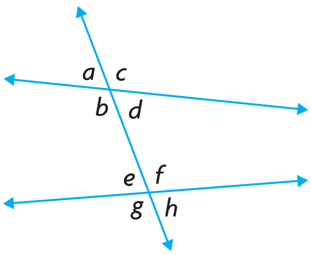
$$A(n) = n(180°) - (n - 2)180°$$
$$A(n) = 360°$$

# PRACTISING

**Lesson 2.1**

**1.** Kamotiqs are sleds that are dragged behind vehicles, such as snowmobiles, over snow and sea ice. Identify a set of parallel lines and a transversal in the photograph of a kamotiq.

**2. a)** Name the pairs of corresponding angles.

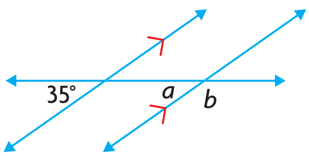



**b)** Are any of the pairs you indentified in part a) equal? Explain.

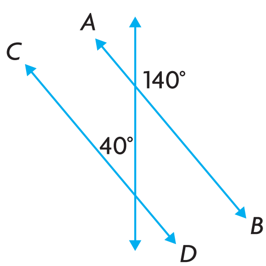
**c)** How many pairs of supplementary angles can you see in the diagram? Name one pair.

**d)** Are there any other pairs of equal angles? If so, name them.

**3.** Determine the values of $a$ and $b$.



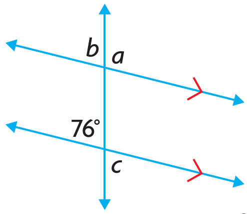

**4.** Is $AB$ parallel to $CD$? Explain how you know.



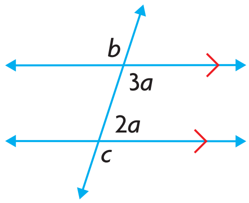

**Lesson 2.2**

**5.** Determine the values of $a$, $b$, and $c$.

**a)**



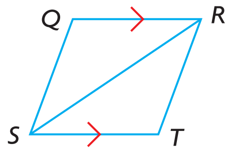

**b)**




**6. a)** Construct a pair of parallel lines using a straight edge and a compass.

**b)** Explain two different ways you could verify that your lines are parallel using a protractor.

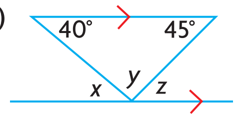
**7.** Given: $QR \parallel ST$
$\angle QRS = \angle TRS$
Prove: $ST = TR$



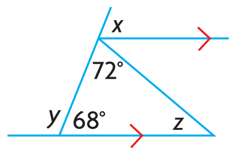

**Lesson 2.3**

**8.** Determine the values of $x$, $y$, and $z$.

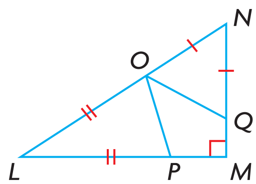
**a)**




**b)**




**9.** Given: $LM \perp MN$
$LP = LO$
$NO = NQ$
Prove: $\angle POQ = 45°$




**Lesson 2.4**

**10. a)** Determine the sum of the measures of the interior angles of a 15-sided regular polygon.

**b)** Show that each exterior angle measures 24°.

**11.** Given: $ABCDE$ is a regular pentagon.
Prove: $AC \parallel ED$