Grade 8 Mathematics (Barr)
Chapter 10: Angles and Triangles **Name:** _____
End-of-Chapter Test (The Pythagorean Theorem) **Date:** _____

Knowledge and Understanding

(1) Indicate whether each statement is true or false.

a. Two parallel lines only intersect once _____

b. A straight angle measures 180° _____

c. Two complementary angles add up to 180° _____

d. In any triangle, the sum of the squares of two sides equals the square of the longest side _____

e. The sum of the interior angles of a regular octagon is 1440° _____

(2) Identify the term that corresponds to each definition.

a. Two angles whose sum is 180° _____

b. An angle that measures 180° _____

c. A line that intersects a line segment to form two 90° angles and divides this line segment into two equal lengths

_____

d. Angles that share a common vertex and a common arm _____

e. The same distance _____

f. Matching angles that are formed by a transversal and two parallel lines

_____

g. The point on a line segment that divides the line segment into two equal parts

_____

h. Non-adjacent angles that are formed by two intersecting lines

_____

i. A straight line that intersects two or more lines _____

j. If two or more lines in a diagram have matching arrowheads, then the lines are

_____

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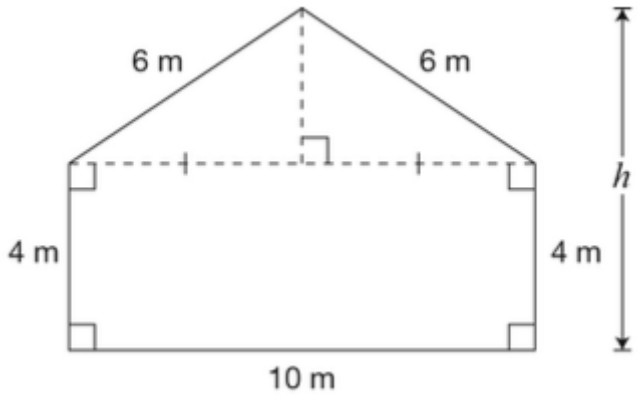
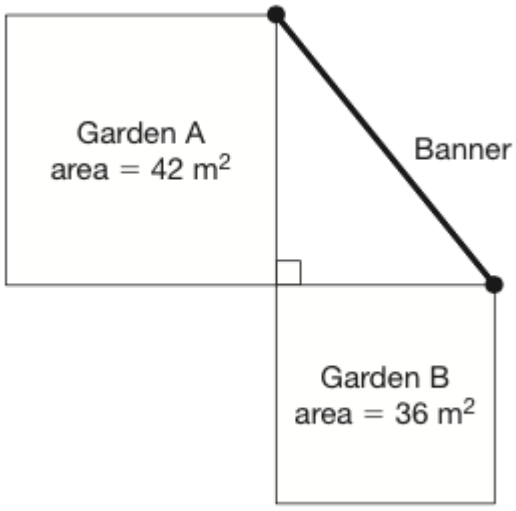
Application

(3) This diagram represents the front view of a house. What is the height (h) of the house?



(4) This is a birds-eye view of two square gardens, which sit corner-to-corner. A welcome banner extends from a corner of Garden A to a corner of Garden B. What is the length of the banner?



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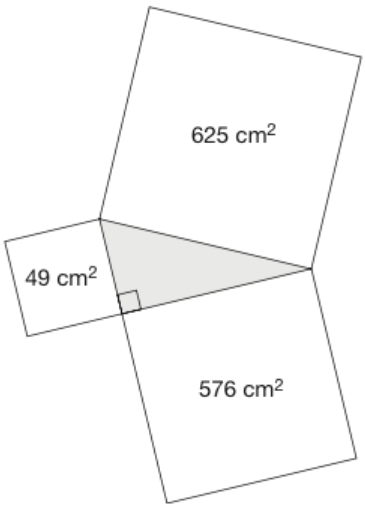
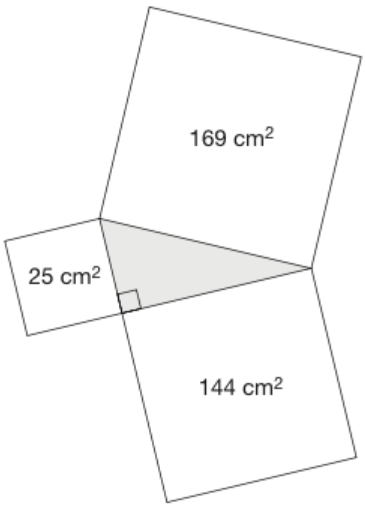
(5) Lillian is trying to drive from City X to City Y. Unfortunately, the 5 km of highway between the two cities is closed. There are two possible detour routes: one through Town A, and one through Town B. Which route is shorter? By how much?

(6) Each of the diagrams below shows a right triangle and a square constructed on each of its sides. According to the Pythagorean Theorem, which diagram is not correct?

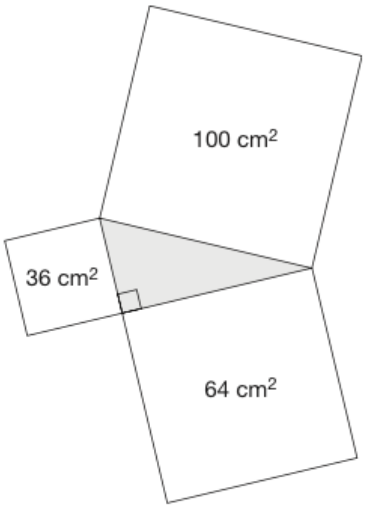
a



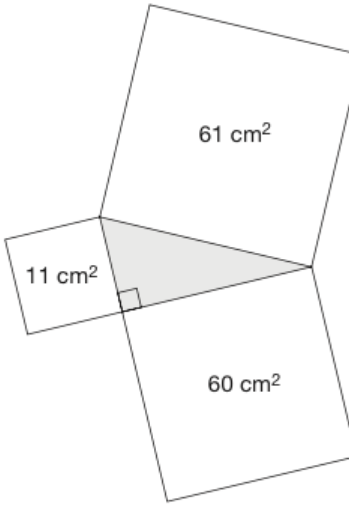
b



c



d



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Thinking and Investigation

(7) You are designing a radio transmission tower that will be 100 m high. It will be supported by cables, called guy wires.
- The guy wires will be anchored on the ground at three equally spaced locations in a circle around the tower.
- The distance of the anchor points from the base of the tower will be one quarter of the height of the tower.
- There will be five guy wires from each anchor point. The guy wires will be attached to five points on the tower at 20 m intervals (the first starting 20 m off the ground).

(A) Draw a diagram as if you were looking down at the base of the tower. Show the location of the three anchor points.

(B) How far are the anchor points from the base of the tower?

(C) Draw a side view of the tower, showing all the guy wires from one anchor point.

(D) Calculate the total amount of guy wire needed. Round your answer to the closest metre.

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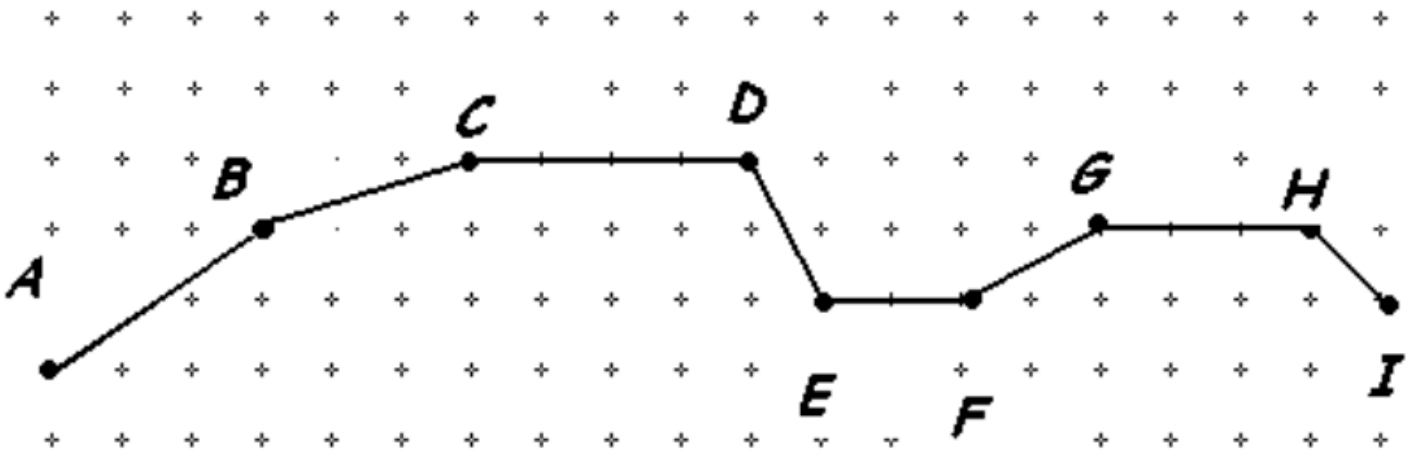
Communication

(8) This is a birds-eye view of a road. Every step left/right or up/down in the grid represents 1 km.
(A) How long is the road? Show all your work.



(B) What does this imply about what mathematicians, engineers and physicists use the Pythagorean Theorem to measure in real life?

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Evaluation Rubric

	Level 4	Level 3	Level 2	Level 1
K/U	**8m47 Determine the angle relationships for intersecting lines, parallel lines and transversals, and the sum of the angles of a triangle**			
	- Identifies all correct answers	- Identifies most correct answers	- Identifies some correct answers	- Identifies few correct answers
App.	**8m50 Solve problems involving right triangles geometrically, using the Pythagorean relationship**			
	- Identifies all correct answers - Shows all steps, and justifies each step using the Pythagorean Theorem and arithmetic - Uses descriptive labels for each section of work	- Identifies most correct answers - Shows most steps, and justifies most steps using angle properties and theorems - Uses descriptive labels for most sections of work	- Identifies some correct answers - Shows some steps, justifying some steps using angle properties and theorems - Uses labels for some sections of work, not all labels are descriptive	- Identifies few correct answers - Shows few or no steps, justifying few or no steps using angle properties and theorems - Uses few or no labels, or labels aren't descriptive
T/I	**8m50 Solve problems involving right triangles geometrically, using the Pythagorean relationship**			
	- Finds the total amount of guy wire needed, with no mistakes - Shows all steps, and justifies each step mathematically - Uses descriptive labels for all sections of work - Explains and justifies solution in words	- Finds the total amount of guy wire needed, with few mistakes - Shows most steps, and justifies most steps mathematically - Uses descriptive labels for most sections of work - Explains and justifies most steps of the solution in words	- Finds the total amount of guy wire needed, with some mistakes - Shows some steps, justifying some steps mathematically - Uses descriptive labels for some sections of work - Explains and justifies some steps of the solution in words	- Finds the total amount of guy wire needed, with multiple mistakes - Shows few steps, justifying few steps mathematically - Uses undescriptive, inaccurate or no labels - Explains and justifies few steps of the solution in words
Comm.	**8m50 Solve problems involving right triangles geometrically, using the Pythagorean relationship**			
	- Calculates the length of the road with a high degree of accuracy - Explains how the Pythagorean Theorem could be used in concrete contexts with a high degree of detail	- Calculates the length of the road with considerable accuracy - Explains how the Pythagorean Theorem could be used in concrete contexts with considerable detail	- Calculates the length of the road with some accuracy - Explains how the Pythagorean Theorem could be used in concrete contexts with some detail	- Calculates the length of the road with limited accuracy, or not at all - Explains how the Pythagorean Theorem could be used in concrete contexts with limited detail, or not at all

Overall Achievement Level

Level	Range	Level	Range	Level	Range	Level	Range
4+	95 - 100 %	3+	77 – 79 %	2+	67 - 69 %	1+	57 - 59 %
4	87 – 94 %	3	73 – 76 %	2	63 – 66 %	1	53 – 56 %
4-	80 – 86 %	3-	70 – 72 %	2-	60 – 62 %	1-	50 – 52 %