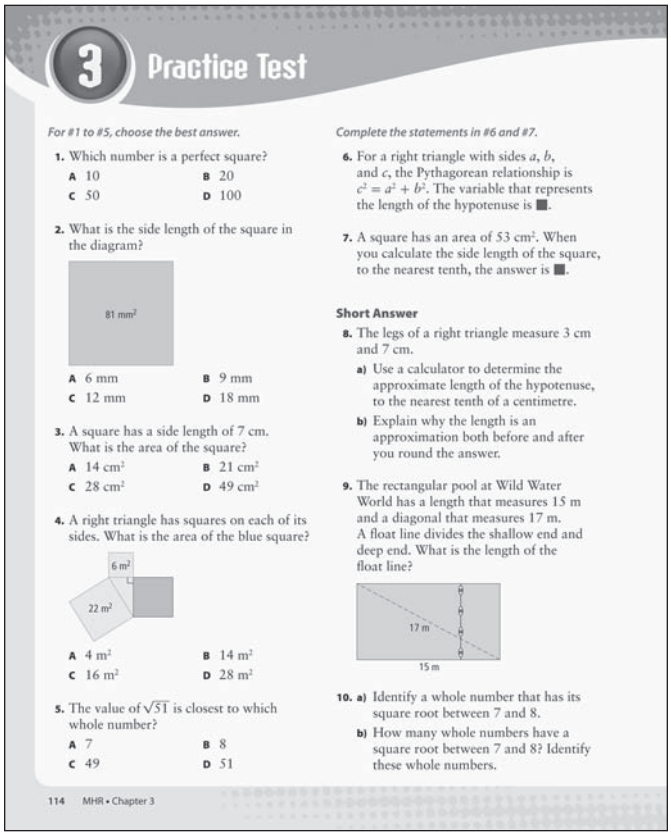
Practice Test 3



3 Practice Test

For #1 to #5, choose the best answer.

1. Which number is a perfect square?

A 10 B 20
C 50 D 100

2. What is the side length of the square in the diagram?

81 mm²

A 6 mm B 9 mm
C 12 mm D 18 mm

3. A square has a side length of 7 cm. What is the area of the square?

A 14 cm² B 21 cm²
C 28 cm² D 49 cm²

4. A right triangle has squares on each of its sides. What is the area of the blue square?

6 m²
22 m²

A 4 m² B 14 m²
C 16 m² D 28 m²

5. The value of $\sqrt{51}$ is closest to which whole number?

A 7 B 8
C 49 D 51

Complete the statements in #6 and #7.

6. For a right triangle with sides a, b, and c, the Pythagorean relationship is $c^2 = a^2 + b^2$. The variable that represents the length of the hypotenuse is ■.

7. A square has an area of 53 cm². When you calculate the side length of the square, to the nearest tenth, the answer is ■.

Short Answer

8. The legs of a right triangle measure 3 cm and 7 cm.

a) Use a calculator to determine the approximate length of the hypotenuse, to the nearest tenth of a centimetre.

b) Explain why the length is an approximation both before and after you round the answer.

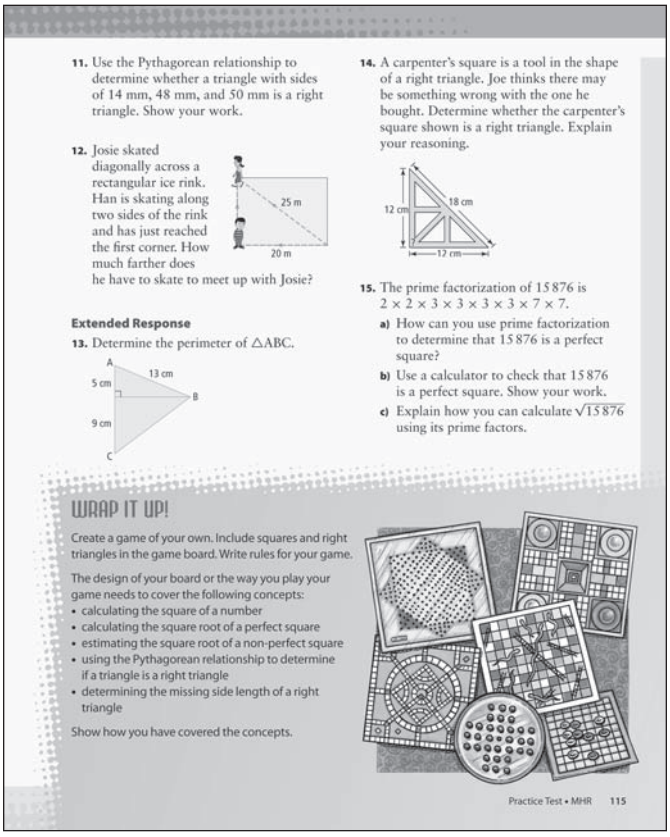
9. The rectangular pool at Wild Water World has a length that measures 15 m and a diagonal that measures 17 m. A float line divides the shallow end and deep end. What is the length of the float line?

17 m
15 m

10. a) Identify a whole number that has its square root between 7 and 8.

b) How many whole numbers have a square root between 7 and 8? Identify these whole numbers.

114 MHR • Chapter 3



11. Use the Pythagorean relationship to determine whether a triangle with sides of 14 mm, 48 mm, and 50 mm is a right triangle. Show your work.

12. Josie skated diagonally across a rectangular ice rink. Han is skating along two sides of the rink and has just reached the first corner. How much farther does he have to skate to meet up with Josie?

25 m
20 m

Extended Response

13. Determine the perimeter of △ABC.

A
5 cm
13 cm
B
9 cm
C

14. A carpenter's square is a tool in the shape of a right triangle. Joe thinks there may be something wrong with the one he bought. Determine whether the carpenter's square shown is a right triangle. Explain your reasoning.

12 cm
18 cm
12 cm

15. The prime factorization of 15 876 is $2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 7 \times 7$.

a) How can you use prime factorization to determine that 15 876 is a perfect square?

b) Use a calculator to check that 15 876 is a perfect square. Show your work.

c) Explain how you can calculate $\sqrt{15\,876}$ using its prime factors.

WRAP IT UP!

Create a game of your own. Include squares and right triangles in the game board. Write rules for your game.

The design of your board or the way you play your game needs to cover the following concepts:

- calculating the square of a number
- calculating the square root of a perfect square
- estimating the square root of a non-perfect square
- using the Pythagorean relationship to determine if a triangle is a right triangle
- determining the missing side length of a right triangle

Show how you have covered the concepts.

Practice Test • MHR 115

***MathLinks 8*, pages 114–115**

Suggested Timing
40–50 minutes

Blackline Masters
BLM 3–18 Chapter 3 Test

Planning Notes

Have students start the practice test by writing the question numbers in their notebook. Have them indicate which questions they need a little help with, a lot of help with, or no help with. Have students first complete the questions they know they can do. Then, have them complete the questions they know something about. Finally, have them do their best on the questions that they are still unsure how to approach.

This practice test can be assigned as an in-class or take-home assignment. Provide students with the number of questions they can comfortably do in one class. These are the minimum questions that will meet the related curriculum outcomes: #3–#5, #7, #8, #10a), #11, #13, and #15.

Study Guide

Question(s)	Section(s)	Refer to	The student can …
1	3.1	Example 1	✓ identify a perfect square
2	3.1	Example 3	✓ determine the square root of a perfect square
3	3.1	Example 2	✓ determine the square of a whole number
4, 6	3.2	Example 1	✓ model the Pythagorean relationship ✓ show how the Pythagorean relationship applies to right triangles
5, 7, 8	3.3	Example 1	✓ estimate the square root of a number that is not a perfect square ✓ explain that a square root on a calculator may be an approximation
9	3.4	Example 2	✓ use the Pythagorean relationship to determine the missing side length of a right triangle
10	3.3	Example 2	✓ identify a number with a square root that is between two given numbers
11	3.2	Example 2	✓ determine whether or not a triangle is a right triangle
12, 14	3.5	Examples 1, 2	✓ apply the Pythagorean relationship to solve problems
13	3.4	Examples 1, 2	✓ use the Pythagorean relationship to determine the missing side length of a right triangle
15	3.1	Examples 1, 3	✓ identify a perfect square using prime factorization ✓ determine the square root of a perfect square

Answers

Chapter 3 Practice Test

1. D **2.** B **3.** D **4.** C **5.** A **6.** c **7.** 7.3 cm

8. a) 7.6 cm

b) Answers will vary. Example: Since 58 is not a perfect square, when the calculator displays the square root of 58, it can show only part of the decimal portion of the answer, so it is an approximation. When you round the answer, it is also an approximation because you are expressing the answer only to a certain decimal place.

9. 8 m

10. a) Answers may vary. Example: 50

b) There are 14 numbers. The numbers are 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, and 63.

11. Yes, it is a right triangle. The sum of the squares of the two shorter sides is $14^2 + 48^2 = 2500$, which equals the square of the long side, $50^2 = 2500$.

12. 15 m **13.** 42 cm

14. No, the carpenter's square is not a right triangle. Answers may vary. Example: The sum of the square of the two shorter sides does not equal the square of the long side.

15. a) Since each prime factor occurs an even number of times in the prime factorization, the number is a perfect square.

b) $\sqrt{15\,876} = 126$

c) Take one prime factor from each pair of prime factors in the prime factorization and multiply: $2 \times 3 \times 3 \times 7 = 126$.

Assessment	Supporting Learning
Assessment *as* Learning	
Chapter 3 Self-Assessment Have students review their earlier responses on the What I Need to Work On tab of their chapter Foldable.	• Have students use their responses on the practice test and work they completed earlier in the chapter to identify areas in which they may need to reinforce their understanding of skills or concepts. Before the chapter test, coach them in the areas in which they are having difficulties.
Assessment *of* Learning	
Chapter 3 Test After students complete the practice test, you may wish to use **BLM 3–18 Chapter 3 Test** as a summative assessment.	• Consider allowing students to use their chapter Foldable. • Consider using the Math Games on page 116 or the Challenge in Real Life on page 117 to assess the knowledge and skills of students who have difficulty with tests.