



# Grade 8 Math: Final Exam Review

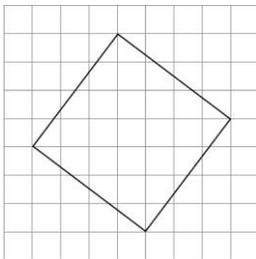
## Unit 1: Square Roots and the Pythagorean Theorem

4. The factors of each number are listed in ascending order.  
Which numbers are square numbers?  
Find a square root of each square number.
- a) 216: 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 27, 36, 54, 72, 108, 216  
b) 196: 1, 2, 4, 7, 14, 28, 49, 98, 196  
c) 441: 1, 3, 9, 21, 49, 147, 441
5. Find a number whose square root is 24.
6. Find the square root of each number.  
a)  $12^2$                       b)  $15^2$                       c)  $37^2$
7. Find the square of each number.  
a)  $\sqrt{9}$                       b)  $\sqrt{121}$                       c)  $\sqrt{841}$

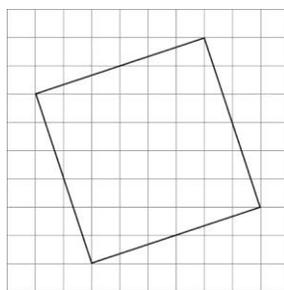
### Lesson 1.3: Measuring Line Segments

1. Simplify.
- a)  $5^2$                       b)  $\sqrt{196}$                       c)  $8^2$                       d)  $\sqrt{225}$   
e)  $1^2$                       f)  $\sqrt{49}$                       g)  $9^2$                       h)  $\sqrt{10\,000}$
2. The area  $A$  of a square is given. Find its side length.  
Which side lengths are whole numbers?
- a)  $A = 9\text{ cm}^2$       b)  $A = 56\text{ m}^2$                       c)  $A = 81\text{ cm}^2$   
e)  $A = 16\text{ m}^2$       f)  $A = 42\text{ cm}^2$                       g)  $A = 72\text{ m}^2$
3. Copy each square on grid paper. Find its area.  
Then write the side length of the square.

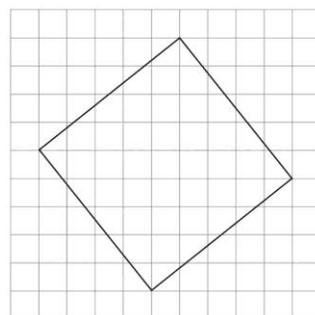
a)



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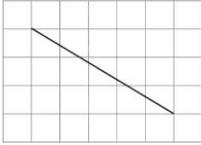


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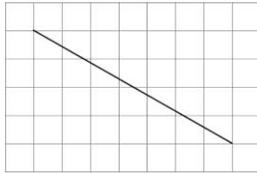
## Unit 1: Square Roots and the Pythagorean Theorem

4. Copy each line segment on grid paper.  
Draw a square on each line segment.  
Find the area of the square and the length of the line segment.

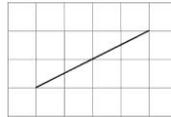
a)



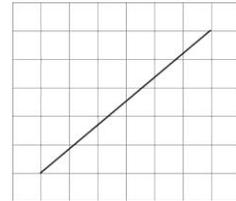
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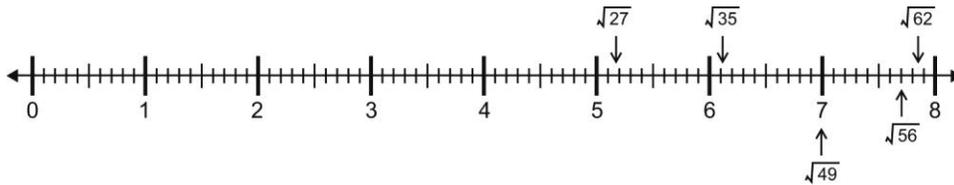


d)



### Lesson 1.4: Estimating Square Roots

1. Use the number line below.
- Which placements are good estimates of the square roots?  
Explain your reasoning.
  - Use the number line to estimate the value of each square root that is incorrectly placed.



2.
  - Which two consecutive numbers is each square root between? How do you know?
  - Use guess and check to estimate the value of each square root to two decimal places.
    - $\sqrt{15}$
    - $\sqrt{72}$
    - $\sqrt{110}$
    - $\sqrt{41}$
3. Is each statement true or false? Explain.
- $\sqrt{19}$  is between 18 and 20.
  - $\sqrt{101}$  is greater than 10.
  - $\sqrt{5 + 10}$  is less than  $\sqrt{5} + \sqrt{10}$ .
  - $\sqrt{3} \times \sqrt{8}$  is less than  $\sqrt{36}$ .
  - $\sqrt{12} + \sqrt{10}$  is less than  $\sqrt{32} - \sqrt{10}$ .
  - $\sqrt{1} + \sqrt{1} + \sqrt{1}$  is equal to  $\sqrt{3}$ .

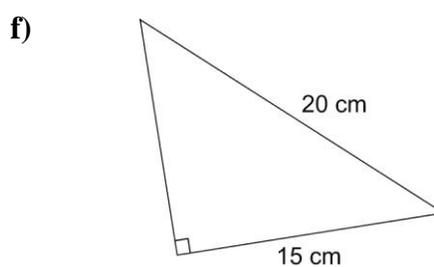
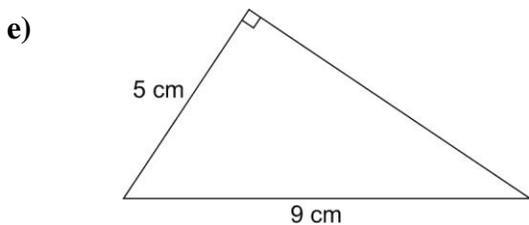
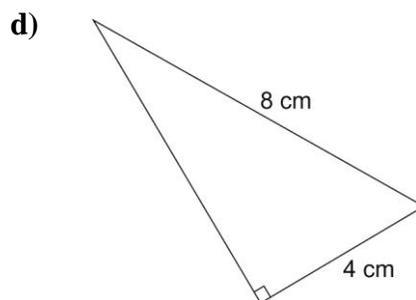
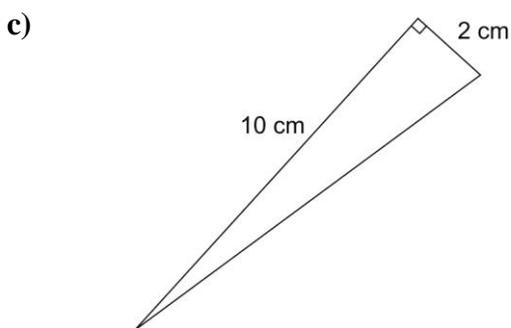
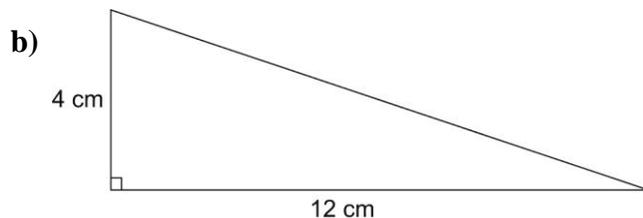
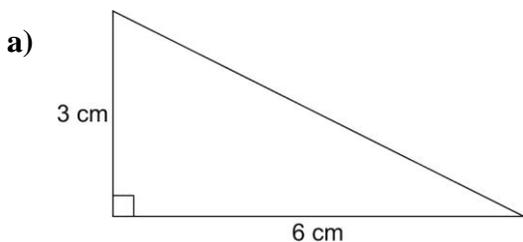
# Grade 8 Math: Final Exam Review

## Unit 1: Square Roots and the Pythagorean Theorem

- Chess is played on a square board.  
A particular board has an area of about  $3250 \text{ cm}^2$ .  
What are the approximate dimensions of the board to two decimal places?
- A farmer has 600 m of fencing.  
He wants to enclose a square field of area  $24\,200 \text{ m}^2$ .  
What are the approximate dimensions of the field?  
Give your answer to one decimal place.  
Does the farmer have enough fencing to enclose the field? Explain.

### Lesson 1.5: The Pythagorean Theorem

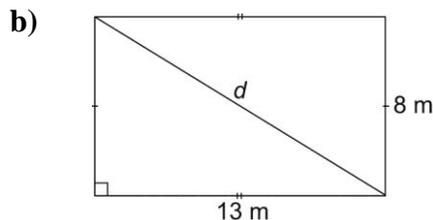
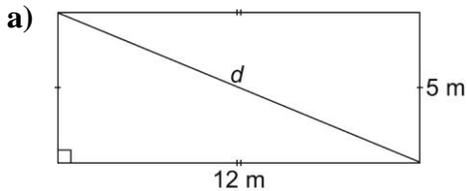
- Find the length of the unmarked side in each right triangle.  
Give your answers to one decimal place.



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## Unit 1: Square Roots and the Pythagorean Theorem

2. Find the length of the diagonal,  $d$ , in each rectangle.  
Give your answers to two decimal places where needed.

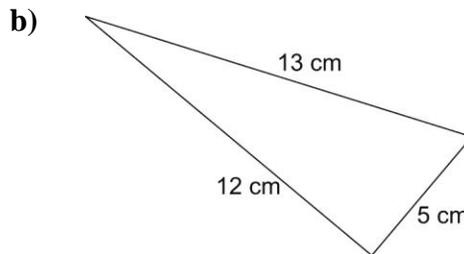
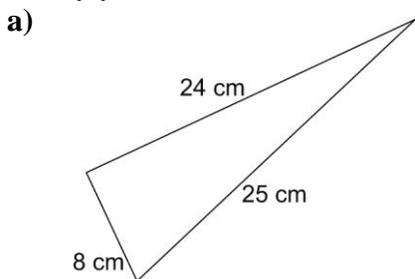


3. On grid paper, draw a line segment with each length. Explain how you did it.

- a)  $\sqrt{20}$  cm      b)  $\sqrt{34}$  cm      c)  $\sqrt{40}$  cm  
d)  $\sqrt{26}$  cm      e)  $\sqrt{37}$  cm      f)  $\sqrt{29}$  cm

### Lesson 1.6: Exploring the Pythagorean Theorem

1. Which of the triangles below appears to be a right triangle?  
Determine whether each triangle is a right triangle.  
Justify your answers.



2. Each set of measurements below represents the side lengths of a triangle.  
Identify which triangles are right triangles.

- How do you know?  
a) 3 cm, 4 cm, 6 cm  
b) 7 m, 24 m, 25 m  
c) 6 cm, 8 cm, 10 cm  
d) 1 m, 2 m,  $\sqrt{5}$  m  
e) 2 m, 3 m,  $\sqrt{12}$  m

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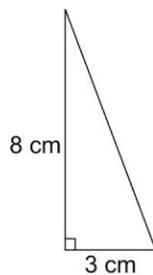
## Unit 1: Square Roots and the Pythagorean Theorem

- Which sets of numbers below are Pythagorean triples?  
a) 20, 21, 29    b) 11, 34, 35    c) 20, 101, 99    d) 30, 34, 16
- Two numbers in a Pythagorean triple are 77 and 85.  
Find the third number.
- A triangle has side length of 5 cm,  $\sqrt{96}$  cm and 11 cm.  
a) Is this triangle a right triangle?  
b) Do these side lengths form a Pythagorean triple? Explain.

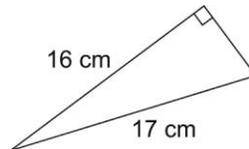
### Lesson 1.7: Applying the Pythagorean Theorem

- Find the length of the unmarked side in each right triangle.  
Give your answers to one decimal place.

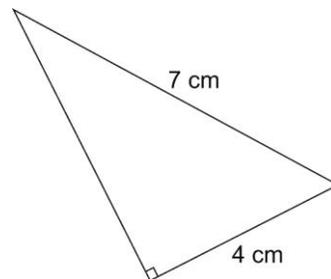
a)



b)



c)



- Jovi is laying a foundation for a garage with dimensions 10 m by 6 m.  
To check that the foundation is square, Jovi measures a diagonal.  
How long should the diagonal be?  
Give your answer to one decimal place.
- A guy wire is 14 m long. It is attached to a TV tower 12 m high.  
The guy wire is fastened to a stake in the ground.  
How far is the stake from the base of the TV tower?  
Give your answer to one decimal place.
- Petra is building a frame for her window.  
The frame is 88 cm wide and 105 cm tall.  
She measures the diagonal of her frame and finds that it is 137 cm.  
Is the frame a rectangle? Justify your answer.

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### Unit 1: Square Roots and the Pythagorean Theorem

5. A sloped mountain road is 13 km long.  
It covers a horizontal distance of 9 km.  
What is the change in elevation of the road?  
Give your answer to one decimal place.
  
6. A cat is stranded in a tree.  
You lean a 10-m ladder against the tree.  
It is 2 m from the base of the tree.  
How far up the tree does the ladder reach?  
Give your answer to one decimal place.