

Target A-3 Extra Practice 3

1. Fill in the blanks to find the missing distance.

$$d^2 = 700^2 + \underline{\hspace{2cm}}^2$$

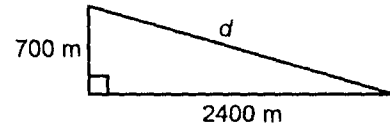
$$d^2 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

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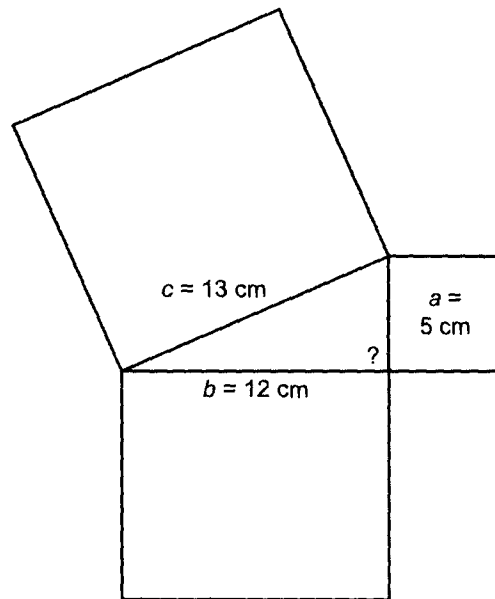
$$d = \sqrt{\underline{\hspace{2cm}}}$$

$$d = \underline{\hspace{2cm}}$$

The hypotenuse is $\underline{\hspace{2cm}}$ m.



2. Fill in the blanks to determine if the triangle is a right triangle. Use the Pythagorean relationship, $c^2 = a^2 + b^2$.



Left Side

$$13^2 = \underline{\hspace{2cm}}$$

The area of the large square is $\underline{\hspace{2cm}}$ cm².

Right Side

$$5^2 + 12^2 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

The sum of the areas of the two smaller squares is $\underline{\hspace{2cm}}$ cm².

Is the triangle a right triangle? YES NO
How do you know?

3. A rectangular field measures 20 m \times 40 m. Stefan walked along the diagonal from one corner to its far corner. Megan walked along the two sides of the field.

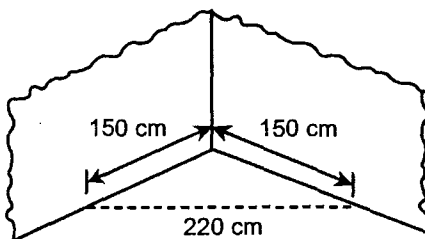
a) Draw a diagram to match this situation.

b) What is the distance Stefan walked? Give your answer to the nearest tenth of a metre.

c) What is the distance Megan walked?

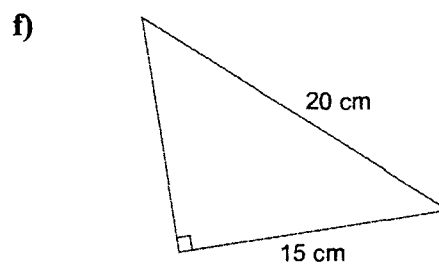
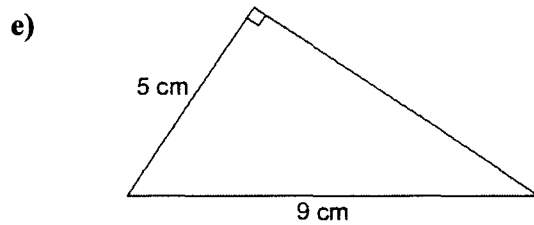
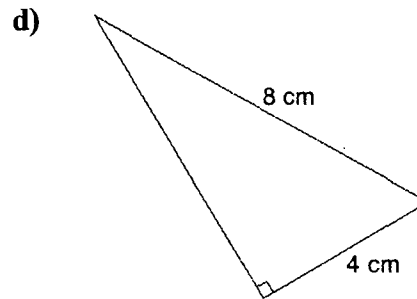
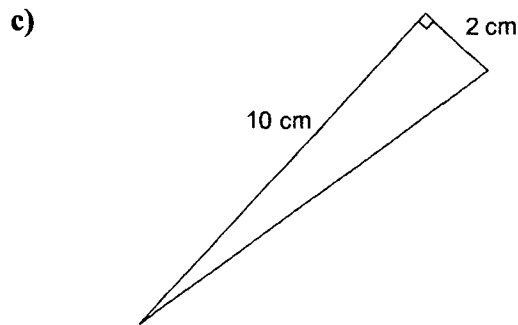
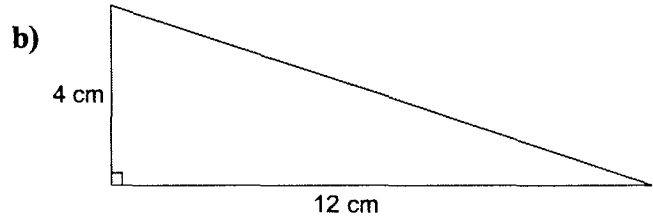
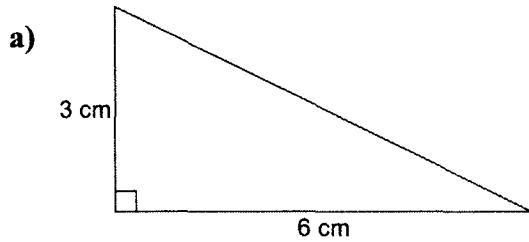
d) Which distance is shorter and by how much? Give your answer to the nearest tenth of a metre.

4. Before Larissa's father builds the roof of a shed, he asks her to check if the walls meet at a right angle. She makes a mark at 150 cm from the corner on each wall. She measures the diagonal length as 220 cm. Do the walls meet at a right angle? Justify your response.

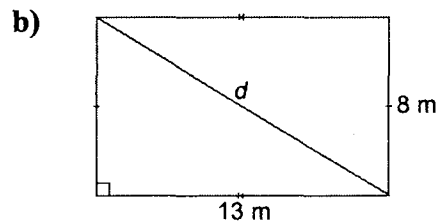
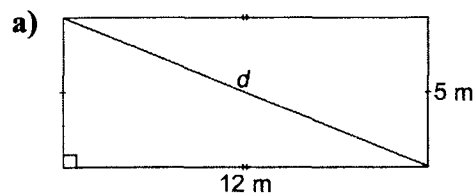


Lesson 1.5: The Pythagorean Theorem

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



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



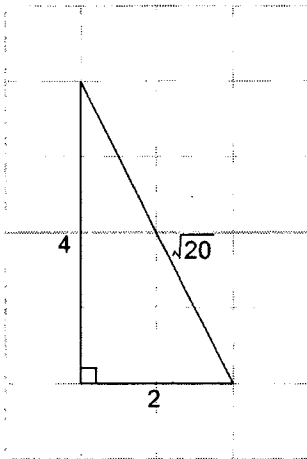
3. On grid paper, draw a line segment with each length. Explain how you did it.

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

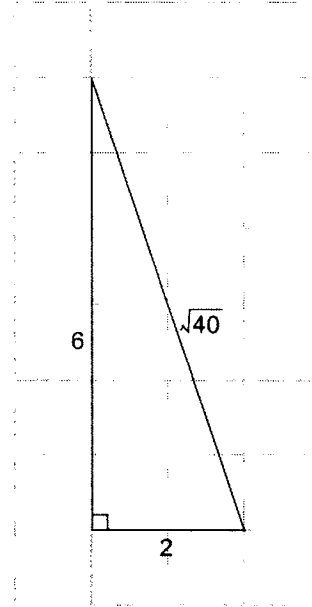
Extra Practice 5 Answers

- About 6.7 cm
 - About 12.6 cm
 - About 10.2 cm
 - About 6.9 cm
 - About 7.5 cm
 - About 13.2 cm
- 13 m
 - About 15.26 cm
- I drew a right triangle so that the area of the square on the hypotenuse equalled the sum of the areas of the squares on the legs.

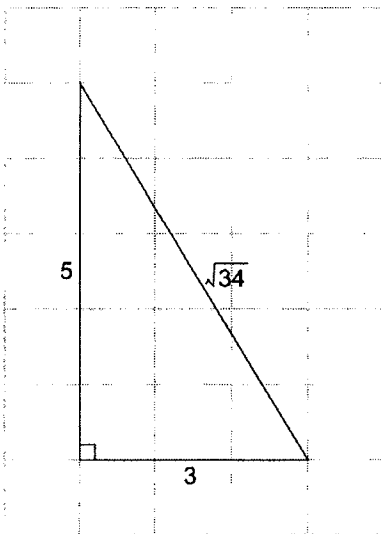
a) $2^2 + 4^2 = (\sqrt{20})^2$



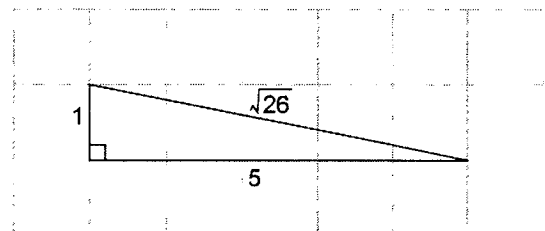
c) $6^2 + 2^2 = (\sqrt{40})^2$



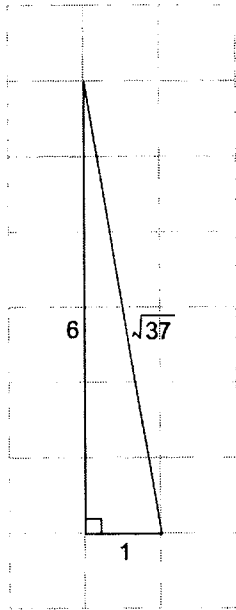
b) $3^2 + 5^2 = (\sqrt{34})^2$



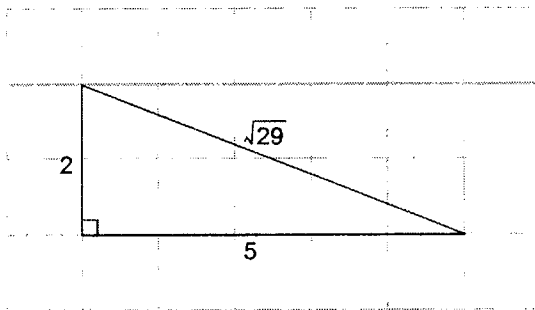
d) $1^2 + 5^2 = (\sqrt{26})^2$



e) $6^2 + 1^2 = (\sqrt{37})^2$



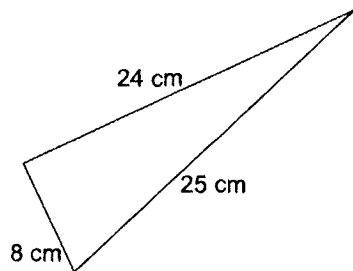
f) $2^2 + 5^2 = (\sqrt{29})^2$



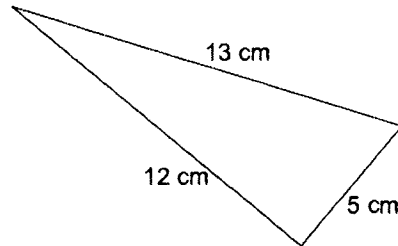
Lesson 1.6: Exploring the Pythagorean Theorem

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

a)



b)



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
3. Which sets of numbers below are Pythagorean triples?
- a) 20, 21, 29 b) 11, 34, 35 c) 20, 101, 99 d) 30, 34, 16
4. Two numbers in a Pythagorean triple are 77 and 85. Find the third number.
5. 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.

Extra Practice 6 Answers

1. a) Does $8^2 + 24^2 = 25^2$?

$$\text{L.S.} = 8^2 + 24^2 = 64 + 576 = 640$$

$$\text{R.S.} = 25^2 = 625$$

No, $640 \neq 625$

So, the triangle is not a right triangle.

b) Does $12^2 + 5^2 = 13^2$?

$$\text{L.S.} = 12^2 + 5^2 = 144 + 25 = 169$$

$$\text{R.S.} = 13^2 = 169$$

Yes, $169 = 169$

So, the triangle is a right triangle

2. The right triangles are the triangles in b, c, and d.

a) Does $3^2 + 4^2 = 6^2$?

$$\text{L.S.} = 3^2 + 4^2 = 9 + 16 = 25$$

$$\text{R.S.} = 6^2 = 36$$

No, $25 \neq 36$

b) Does $7^2 + 24^2 = 25^2$?

$$\text{L.S.} = 7^2 + 24^2 = 49 + 576 = 625$$

$$\text{R.S.} = 25^2 = 625$$

Yes, $625 = 625$

c) Does $6^2 + 8^2 = 10^2$?

$$\text{L.S.} = 6^2 + 8^2 = 36 + 64 = 100$$

$$\text{R.S.} = 10^2 = 100$$

Yes, $100 = 100$

d) Does $1^2 + 2^2 = (\sqrt{5})^2$?

$$\text{L.S.} = 1^2 + 2^2 = 1 + 4 = 5$$

$$\text{R.S.} = (\sqrt{5})^2 = 5$$

Yes, $5 = 5$

e) Does $2^2 + 3^2 = (\sqrt{12})^2$?

$$\text{L.S.} = 2^2 + 3^2 = 4 + 9 = 13$$

$$\text{R.S.} = (\sqrt{12})^2 = 12$$

No, $13 \neq 12$

3. The Pythagorean triples are the sets in a, c, and d.

4. 36

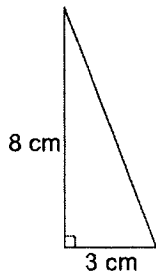
5. a) Yes, it is a right triangle. $5^2 + (\sqrt{96})^2 = 11^2$

b) They do not form a Pythagorean triple since $\sqrt{96}$ is not a whole number.

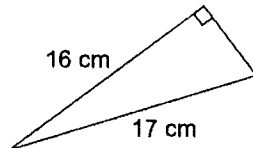
Lesson 1.7: Applying the Pythagorean Theorem

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

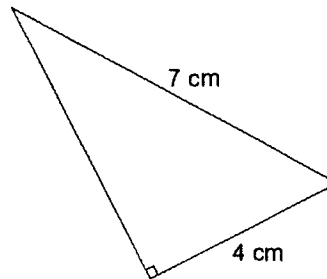
a)



b)



c)



2. 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.
3. 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.
4. 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.
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.

Extra Practice Answers

- About 8.5 cm
 - About 5.7 cm
 - About 5.71 cm
- About 11.7 m
- About 7.2 m
- Does $88^2 + 105^2 = 137^2$?
L.S. = $88^2 + 105^2 = 7744 + 11\,025 = 18\,769$
R.S. = $137^2 = 18\,769$
Yes, $18\,769 = 18\,769$
So, the frame is a rectangle since its corners form right angles.
- About 9.4 km
- About 9.8 m

Target A-3 Extra Practice 2

1. Fill in the blanks to find the length of the hypotenuse of the right triangle.

$$t^2 = r^2 + s^2$$

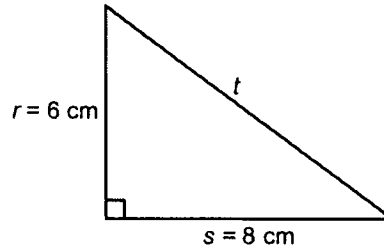
$$t^2 = \underline{\quad}^2 + \underline{\quad}^2$$

$$t^2 = \underline{\quad} + \underline{\quad}$$

$$t^2 = \underline{\quad}$$

$$t = \sqrt{\underline{\quad}}$$

$$t = \underline{\quad}$$



The length of the hypotenuse is $\underline{\quad}$ cm.

2. Fill in the blanks to find the unknown leg length of the right triangle.

$$e^2 + f^2 = g^2$$

$$e^2 + \underline{\quad}^2 = \underline{\quad}^2$$

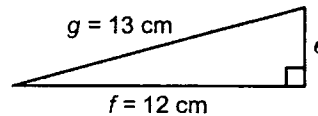
$$e^2 + \underline{\quad} = \underline{\quad}$$

$$e^2 + \underline{\quad} - \underline{\quad} = \underline{\quad} - \underline{\quad}$$

$$e^2 = \underline{\quad}$$

$$e = \sqrt{\underline{\quad}}$$

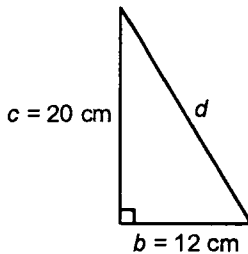
$$e = \underline{\quad}$$



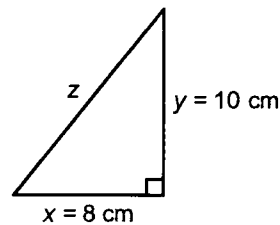
The length of leg e is $\underline{\quad}$ cm.

3. What is the length of the hypotenuse of each right triangle? Show your work. Give your answer to the nearest tenth of a centimetre.

a)

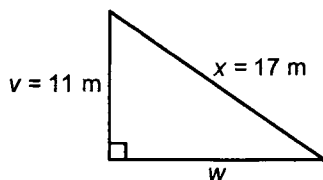


b)

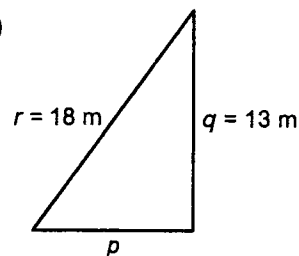


4. Use the Pythagorean relationship to determine the unknown leg length of each right triangle. Give your answer to the nearest metre. Show your work.

a)



b)



Extra Practice Answers

1. $t^2 = 6^2 + 8^2$, $t^2 = 36 + 64$, $t^2 = 100$,
 $t = \sqrt{100}$, $t = 10$, 10 cm

2. $e^2 + 12^2 = 13^2$, $e^2 + 144 = 169$,
 $e^2 + 144 - 144 = 169 - 144$, $e^2 = 25$, $e = \sqrt{25}$, $e = 5$, 5 cm

3. a) $d^2 = 12^2 + 20^2$, $d^2 = 144 + 400$,
 $d^2 = 544$, $d \approx 23.3$, 23.3 cm

b) $z^2 = 8^2 + 10^2$, $z^2 = 64 + 100$, $z^2 = 544$,
 $z \approx 12.8$, 12.8 cm

4. a) $11^2 + w^2 = 17^2$, $121 + w^2 = 289$,
 $121 - 121 + w^2 = 289 - 121$, $w^2 = 168$,
 $w \approx 13$, 13 m

b) $p^2 + 13^2 = 18^2$, $p^2 + 169 = 324$,
 $p^2 + 169 - 169 = 324 - 169$, $p^2 = 155$,
 $p \approx 12$, 12 m