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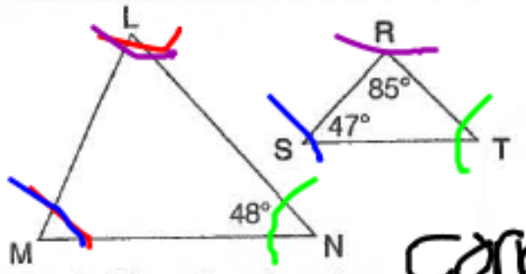
Practise: Similar Triangles

Section 6.1

In geometry, the word *similar* has a particular meaning. Similar triangles have the same angles but not necessarily the same sides.

1. Find the measure of ∠L, ∠M, and ∠T given that ΔLMN ~ ΔRST.

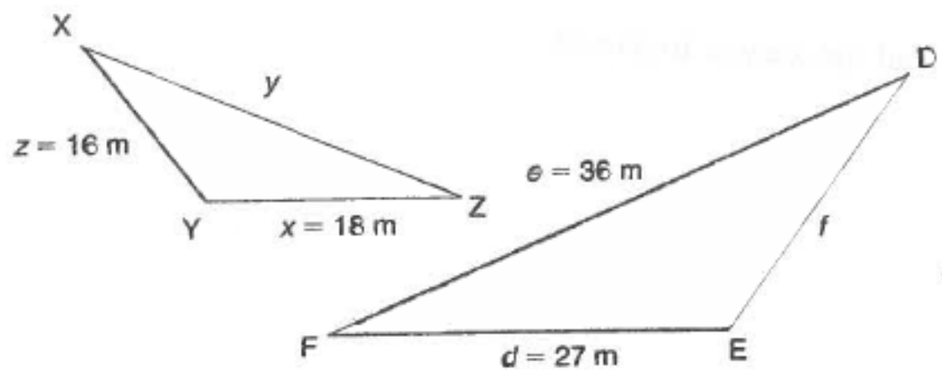


Hint
The ~ symbol means that two shapes are similar.

In similar triangles, the corresponding angles are equal.

So, ∠L = ∠R = 85°, ∠M = ∠S = 47°, and ∠T = ∠N = 48°.

2. These two cottage lots are similar triangles. Find the lengths of sides *y* and *f*.



Hint
Remember that *x* represents the side opposite ∠X, *y* is opposite ∠Y, and so on.

In similar triangles, the _____ sides are proportional.

Here, *x* corresponds to *d*, *y* corresponds to _____, and _____ corresponds to *f*.

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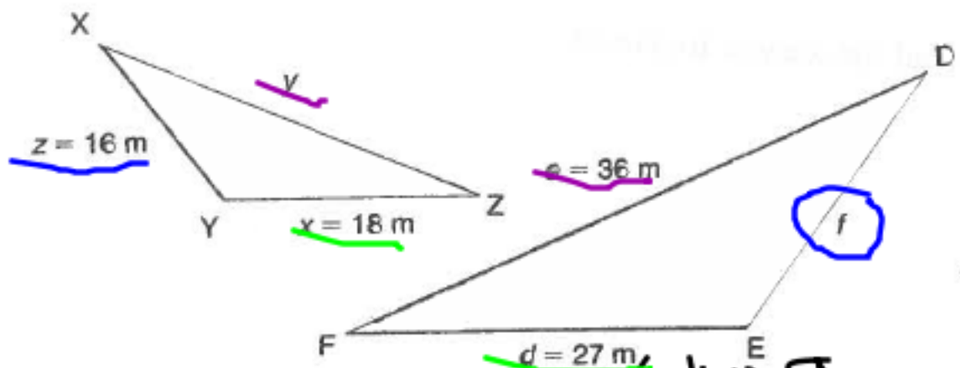
$\angle T = \angle\_\_\_\_ = \_\_\_\_°$.

2. These two cottage lots are similar triangles. Find the lengths of sides y and f.



Hint
Remember that x represents the side opposite $\angle X$, y is opposite $\angle Y$, and so on.

In similar triangles, the corresponding sides are proportional.

Here, x corresponds to d, y corresponds to e, and z corresponds to f.

Write the proportion: $\frac{x}{d} = \frac{y}{e} = \frac{z}{f}$

Substitute the known lengths: $\frac{18}{27} = \frac{y}{36} = \frac{16}{f}$

$\frac{18}{27} = \frac{y}{36}$ and $\frac{18}{27} = \frac{16}{f}$

$\frac{18 \times 36}{27} = y$

$\_\_\_\_ = y$

$\_\_\_\_ f = 16 \times \square$

$f = \frac{16 \times \square}{\square}$

$f = \_\_\_\_$

Hint
The numerators are the side lengths of one triangle, and the denominators are the side lengths of the other triangle.

Hint
Remember to give the units in your concluding statement.

continued ....

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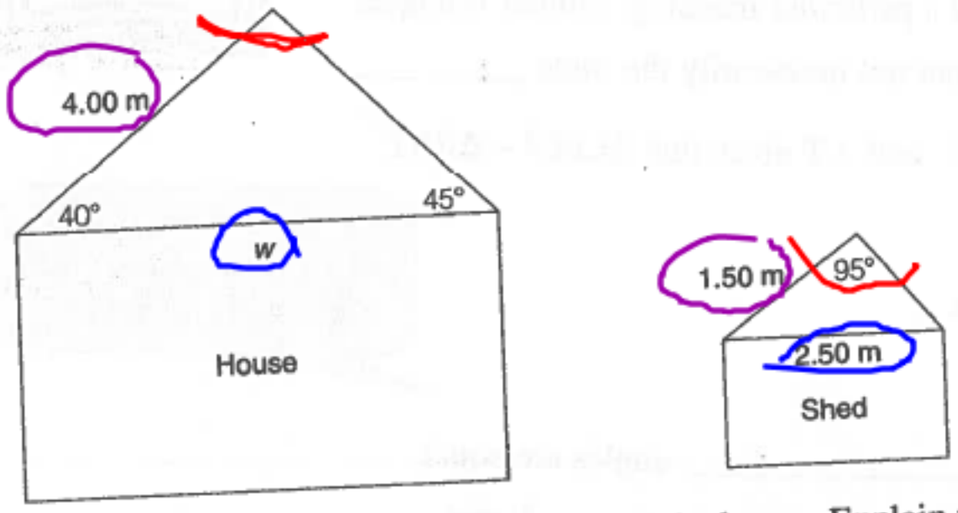
Section 6.1

3. This house and garden shed were built with similar shapes.



a) Find the angle at the top of the roof of the house. Explain your reasoning.

The corresponding angle on the shed is 95°

b) Describe another way to find the answer to part a).

$180 - 40 - 45 = 95°$

c) How wide is the house?

$\frac{1.5}{4} = \frac{2.5}{w}$

4. Gerald wants to build a platform so that he has a level surface to work on while shingling the roof shown below. For the platform to be level, the profiles

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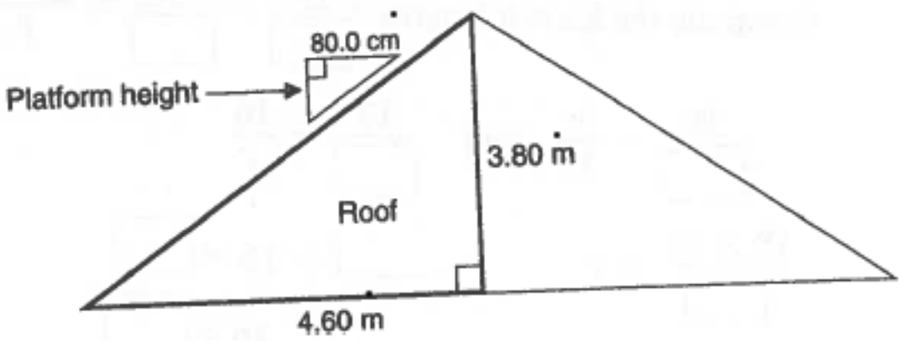
b) Describe another way to find the answer to part a).

c) How wide is the house?

4. Gerald wants to build a platform so that he has a level surface to work on while shingling the roof shown below. For the platform to be level, the profiles of the platform and the roof must be similar triangles. How high should he make the platform, to the nearest centimetre?



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Practise: The Pythagorean Relation

Section 6.3

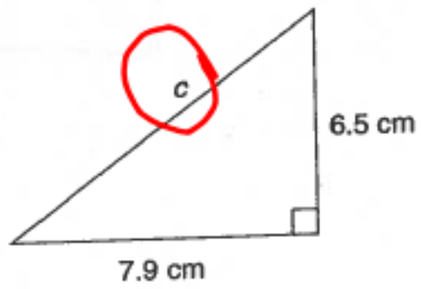
Use the word list to fill in the blanks.

The area of the square placed on the longest side of any right triangle is equal to the sum of the areas of the squares placed on the other two sides. The Pythagorean Relation applies only to right triangles.

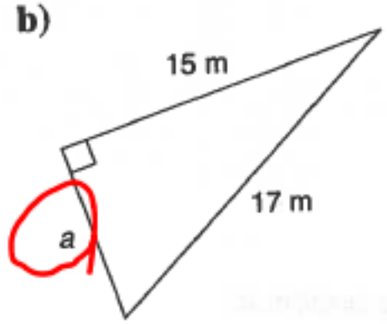
Word List
areas
longest
right
square
sum
two

1. Find the length of the unknown side in each triangle. Round to the same precision as the known lengths.

a)



b)



a) Identify the hypotenuse: _____

Apply the Pythagorean Relation: _____$^2 = 6.5^2 + 7.92$

Simplify: _____^{2} = _____ + _____

_____^{2} = _____

Take the square root of both sides: _____ = $\pm\sqrt{}$

Round to _____ decimal place: _____ = _____

Reject the negative value since c represents a _____.

The length of side c is _____ cm.

Hint
The hypotenuse is the longest side and is always located opposite the right angle.

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