Advanced Trigonometry - Lesson 4

Sine Rule (Angle)

LI

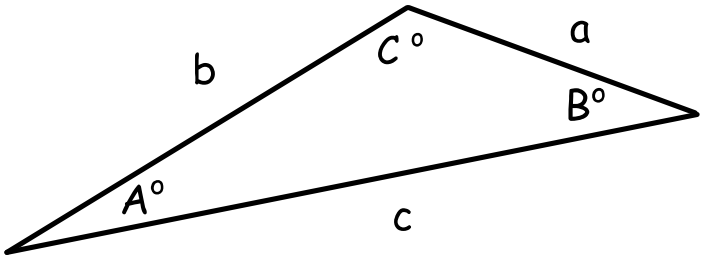
- Use the Sine Rule to find a missing angle in any triangle.

SC

- Use a calculator properly.

Jan 10-12:11

Sine Rule



For finding angles, better to use Sine Rule with Sines on top :

$$\frac{\sin A^\circ}{a} = \frac{\sin B^\circ}{b} = \frac{\sin C^\circ}{c}$$

Sep 5-08:28

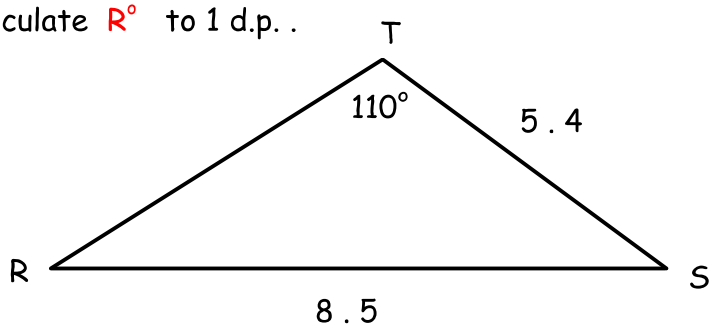
Strategy for Finding Missing Angle

- Sketch triangle and label all sides and angles
- Write down Sine Rule (with Sines on top)
- Tick the things you know
- Solve for missing angle

Oct 10-08:07

Example 1

Calculate R° to 1 d.p. .



$$\frac{\sin R^\circ}{r} = \frac{\sin S^\circ}{s} = \frac{\sin T^\circ}{t}$$

$R^\circ =$, $r = 5.4$

$S^\circ =$, $s =$

$T^\circ = 110^\circ$, $t = 8.5$

$$\frac{\sin R^\circ}{r} = \frac{\sin T^\circ}{t}$$

$$\frac{\sin R^\circ}{5.4} = \frac{\sin 110^\circ}{8.5}$$

$$\sin R^\circ = \frac{(5.4 \times \sin 110^\circ)}{8.5}$$

$$\sin R^\circ = 0.596\ldots$$

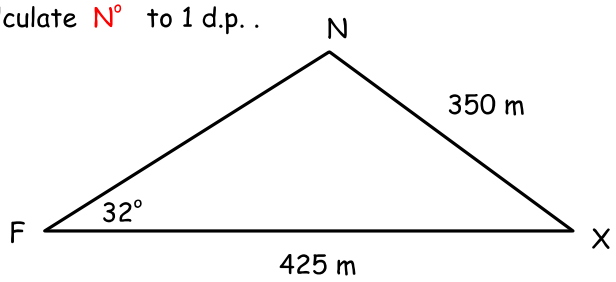
$$R^\circ = \sin^{-1}(0.596\ldots)$$

$$R^\circ = 36.7^\circ$$

Oct 2-08:19

Example 2

Calculate N° to 1 d.p. .



$$\frac{\sin X^\circ}{x} = \frac{\sin N^\circ}{n} = \frac{\sin F^\circ}{f}$$

$X^\circ =$, $x =$

$N^\circ =$, $n = 425$ m

$F^\circ = 32^\circ$, $f = 350$ m

$$\frac{\sin N^\circ}{n} = \frac{\sin F^\circ}{f}$$

$$\frac{\sin N^\circ}{425} = \frac{\sin 32^\circ}{350}$$

$$\sin N^\circ = \frac{(425 \times \sin 32^\circ)}{350}$$

$$\sin N^\circ = 0.643\ldots$$

$$N^\circ = \sin^{-1}(0.643\ldots)$$

$$N^\circ = 40.1^\circ$$

But N° is obtuse, so

$$N^\circ = 180^\circ - 40.1^\circ$$

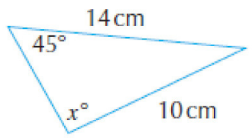
$$N^\circ = 139.9^\circ$$

Oct 2-08:19

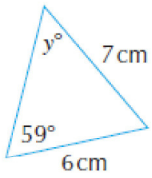
Questions

2 Find the size of the missing angles in each example. Give your answers to 1 decimal place.

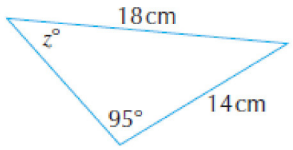
a



b



c



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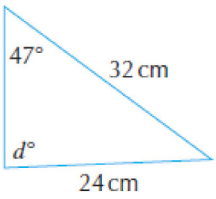

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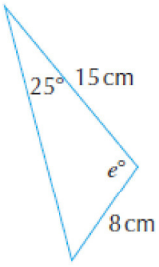

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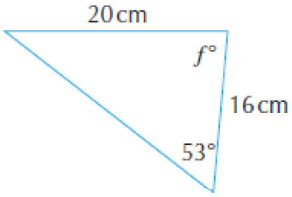
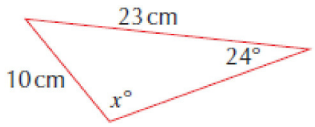
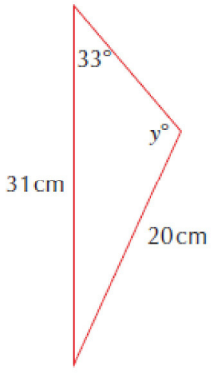


3 Find the obtuse angles in each of the triangles. Give your answers to 1 decimal place.

a



b



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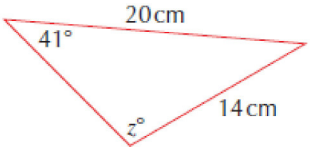
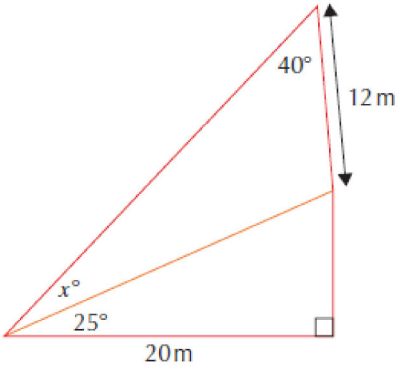


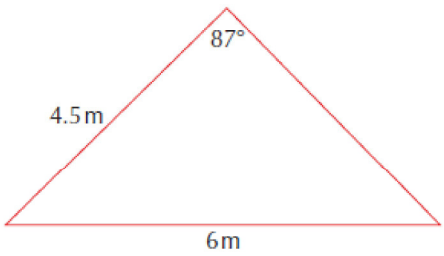
5 Calculate the size of the missing angle x in the diagram. Give your answer to 1 decimal place.



9 The cross-section of a roof truss is shown.

a Calculate the size of the missing angles. Give your answers to 1 decimal place.

b Calculate the vertical height of the roof. Give your answer to 1 decimal place.



Feb 4-12:58

Answers

2 **a** 81.9°
b 47.3°
c 50.8°
d 77.2°
e 102.6°
f 87.3°

3 **a** 110.7
b 122.4
c 110.4

5 20.5°

9 **a** 48.5°, 44.5°
b 3.2 m

Dec 18-14:20