Advanced Trigonometry - Lesson 5

Mixed Sine and Cosine Rules

LI

- Determine missing lengths and angles in any triangle.

SC

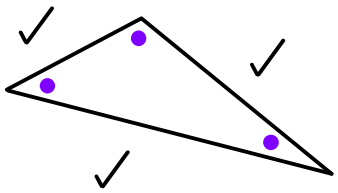
- Identify correct information.
- Sine and Cosine Rules.

Jan 10-12:11

Identifying Correct Information

Given 3 sides . . .

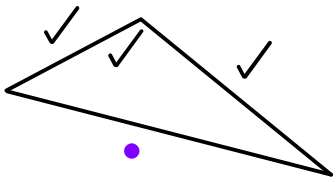
. . . and required to work out an angle



Cosine Rule for Angle

Given 2 sides and angle made by the 2 sides . . .

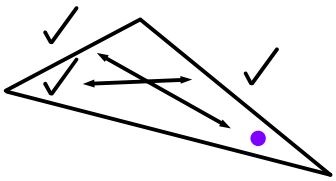
. . . and required to work out a length



Cosine Rule for Length

Given 2 sides and an angle opposite one of the sides . . .

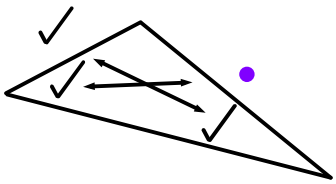
. . . and required to work out an angle opposite the other side



Sine Rule for Angle

Given 2 angles and a side opposite one of the angles . . .

. . . and required to work out a length opposite the other angle

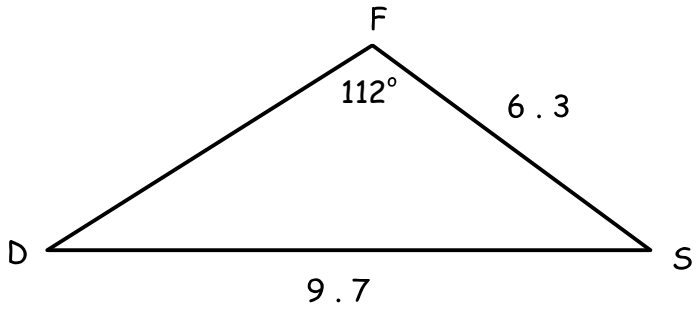


Sine Rule for Length

Feb 23-08:14

Example 1

Calculate angle D° to 1 d.p. .



$$\frac{\sin D^\circ}{d} = \frac{\sin S^\circ}{s} = \frac{\sin F^\circ}{f}$$

$D^\circ =$, $d = 6.3$

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

$F^\circ = 112^\circ$, $f = 9.7$

$$\frac{\sin D^\circ}{d} = \frac{\sin F^\circ}{f}$$

$$\frac{\sin D^\circ}{6.3} = \frac{\sin 112^\circ}{9.7}$$

$$\sin D^\circ = \frac{(6.3 \times \sin 112^\circ)}{9.7}$$

$$\sin D^\circ = 0.602\ldots$$

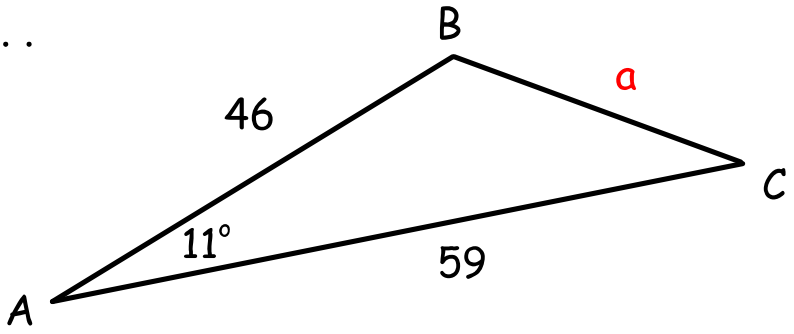
$$D^\circ = \sin^{-1}(0.602\ldots)$$

$$D^\circ = 37.0^\circ$$

Oct 2-08:19

Example 2

Calculate BC to 1 d.p..



$A^\circ = 11^\circ$, $a =$

$B^\circ =$, $b = 59$

$C^\circ =$, $c = 46$

$$a^2 = b^2 + c^2 - 2bc\cos A^\circ$$

$$a^2 = 59^2 + 46^2 - (2 \times 59 \times 46 \times \cos 11^\circ)$$

$$a^2 = 3\,481 + 2\,116 - (5\,328.27\ldots)$$

$$a^2 = 268.72\ldots$$

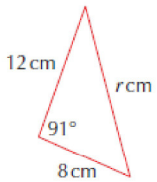
$$a = 16.4$$

Oct 2-08:19

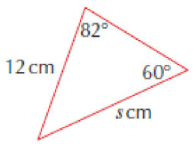
Questions

1 In each triangle shown calculate the value of the letter by selecting the correct formula. Give your answers to 2 decimal places.

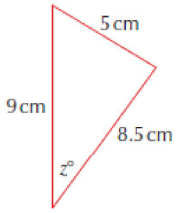
a



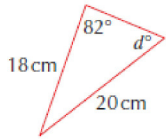
b



c



d



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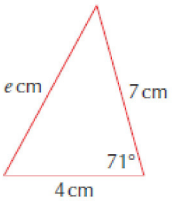

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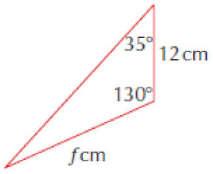

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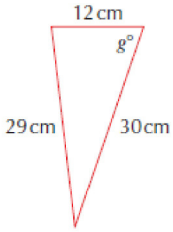

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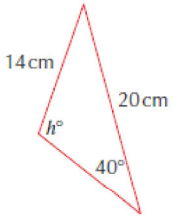
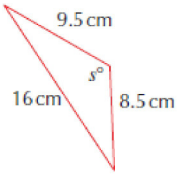
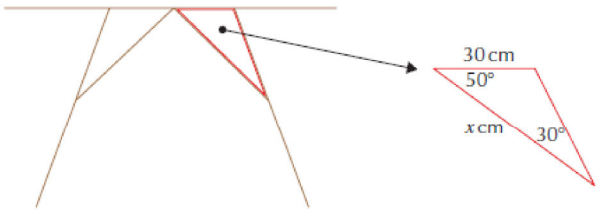


i

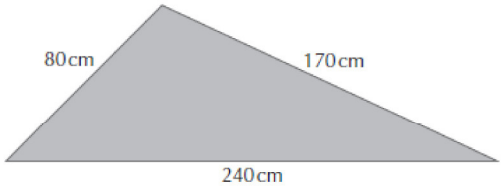


3 The hands on a clock are 4 cm and 6 cm long. What is the distance between the points when the time is 4 o'clock?

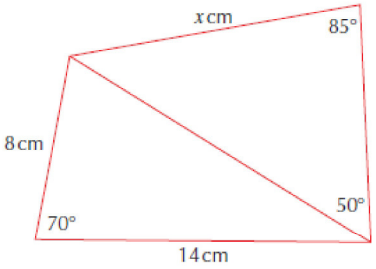
4 A picnic table is designed as shown. Calculate the length of the support bar marked x.



5 The diagram shows a skateboard ramp. Calculate the angles at either side of the ramp to 1 decimal place.



6 Calculate the value of x to 2 significant figures.



Feb 4-12:58

Answers

1	**a**	14.54 cm	**3**	8.72 cm
	b	13.72 cm	**4**	59.1°
	c	33.05°	**5**	23.9°, 11°
	d	63.03°	**6**	10.41 cm
	e	6.84 cm		
	f	26.59 cm		
	g	73.62°		
	h	113.33°		
	i	125.38°		

Dec 18-14:20