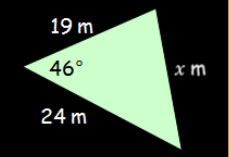
Outcome 3 – The Cosine Rule

Bronze example

Examples...

Find the length of the missing side...



- Substitute into formula...
- Evaluate... • Square Root...

$x^2 = 19^2 + 24^2 - 2 \times 19 \times 24 \times \cos 46$

$x^2 = 303{\cdot}4715...$

$x = \sqrt{303{\cdot}4715...} = 17{\cdot}42$ m

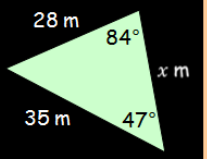
Silver example

Examples...

84 + 47 = 131

180 - 131 = 49

Find the length of the missing side...



- Substitute into formula...
- Evaluate... • Square Root...

$x^2 = 28^2 + 35^2 - 2 \times 28 \times 35 \times \cos 49$

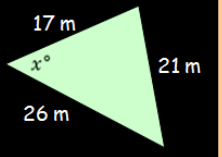
$x^2 = 723{\cdot}1243...$

$x = \sqrt{723{\cdot}1243...} = 26{\cdot}89$ m

Gold example

Examples...

Calculate the size of the missing angle...



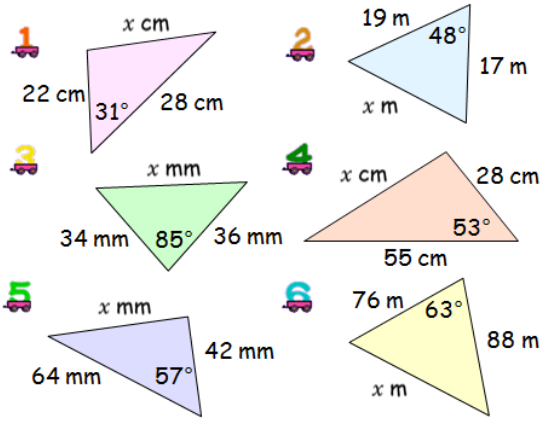
- Substitute into formula...
- Evaluate... • Inverse cosine...

$\cos x = \frac{17^2 + 26^2 - 21^2}{2 \times 17 \times 26} = 0{\cdot}5927...$

$x = \cos^{-1} 0{\cdot}5927... = 53{\cdot}65°$

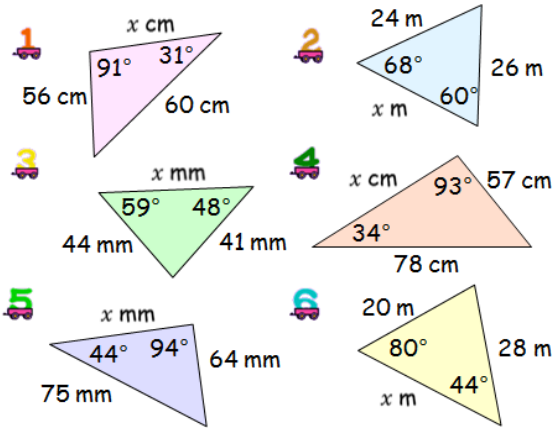
Bronze Questions

Find the missing sides in the following triangles...



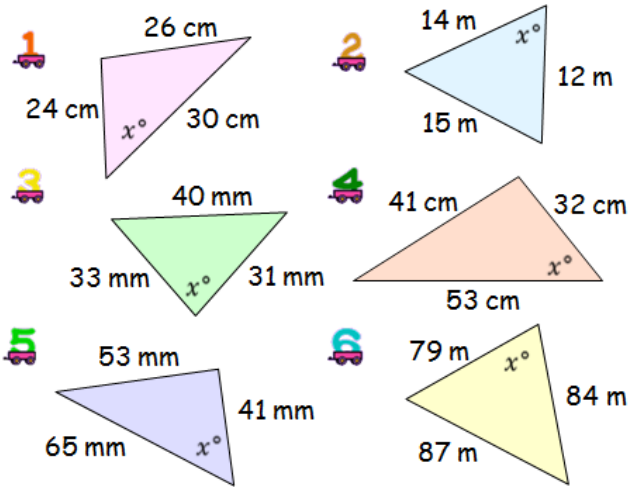
Silver Questions

Find the missing sides in the following triangles...



Gold Questions

Find the missing angles in the following triangles...



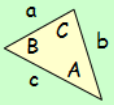
Take a Note!

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

Two sides and an included angle

$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$

3 sides



Bronze Answers

1.	14·56 cm	2.	14·76 m
3.	47·31 mm	4.	44·22 cm
5.	54·15 mm	6.	86·30 m

Silver Answers

1.	56·35 cm	2.	21·99 m
3.	50·62 mm	4.	63·10 cm
5.	50·86 mm	6.	23·62 m

Gold Answers

1.	56·25°	2.	69·99°
3.	77·29°	4.	50·62°
5.	54·48°	6.	64·43°