Outcome 2 – The Sine Rule

Bronze example

Examples...

Find the length of the missing side...

- Substitute into formula...
- Cross multiply...
- Divide...

$$\frac{x}{\sin 41} = \frac{13}{\sin 53}$$

$x \sin 53 = 13 \sin 41$

$$x = \frac{13 \sin 41}{\sin 53} = 10{\cdot}68 \text{ m}$$

13 m, 41°, 53°, x m

Silver example

Examples...

Find the length of the missing side...

- Substitute into formula...
- Cross multiply...
- Divide...

$$\frac{x}{\sin 66} = \frac{14}{\sin 60}$$

$x \sin 60 = 14 \sin 66$

$$x = \frac{14 \sin 66}{\sin 60} = 14{\cdot}77 \text{ m}$$

14 m, 54°, 60°, x m

54 + 50 = 114

180 – 114 = 66

Gold example

Examples...

Calculate the size of the missing angle...

- Substitute into formula...
- Cross multiply...
- Divide...
- Inverse sine...

$$\frac{16}{\sin 39} = \frac{18}{\sin x}$$

$16 \sin x = 18 \sin 39$

$$\sin x = \frac{18 \sin 39}{16} = 0{\cdot}707\ldots$$

$x = \sin^{-1} 0{\cdot}707\ldots = 45{\cdot}07°$

18 m, 39°, 16 m, $x°$

Bronze Questions

Find the missing sides in the following triangles...

1. x cm, 87°, 33°, 16 cm
2. 35°, 42°, 21 m, x m
3. x mm, 52°, 26 mm, 84°
4. x cm, 93°, 41°, 51 cm
5. x mm, 37°, 58°, 26 mm
6. 51°, 69°, 82 m, x m

Silver Questions

Find the missing sides in the following triangles...

1. x cm, 97°, 24°, 32 cm
2. 47°, 68°, 48 m, x m
3. x mm, 57°, 38°, 79 mm
4. x cm, 31°, 60°, 93 cm
5. x mm, 94°, 53°, 28 mm
6. 77°, 53°, 65 m, x m

Gold Questions

Find the missing angles in the following triangles...

1. 14 cm, $x°$, 29°, 20 cm
2. 42°, $x°$, 24 m, 23 m
3. 34 mm, 58°, 29 mm, $x°$
4. 49 cm, 94°, $x°$, 56 cm
5. 59 mm, 28°, 43 mm, $x°$
6. 63°, $x°$, 85 m, 89 m

Take a Note!

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

****opposites****

Bronze Answers

1.	8·73 cm	2.	18·0 m
3.	32·81 mm	4.	33·50 cm
5.	36·64 mm	6.	68·26 m

Silver Answers

1.	27·64 cm	2.	59·48 m
3.	127·83 mm	4.	80·55 cm
5.	41·06 mm	6.	82·68 m

Gold Answers

1.	43·84°	2.	44·28°
3.	83·86°	4.	60·79°
5.	40·10°	6.	58·32°