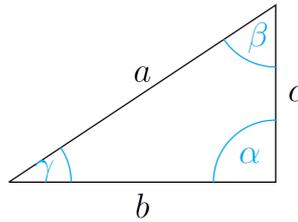


Trigonometry

1. Convert the following angles into degree or radian measure

- | | |
|----------------|---------------------|
| a) 90° | e) π |
| b) 60° | f) $\frac{\pi}{4}$ |
| c) 1° | g) $\frac{2\pi}{3}$ |
| d) 120° | h) 5π |

2. The following triangle is given:



a) Complete the following table (noting that α is not necessarily a right angle, contrary to what the sketch suggests).

a	b	c	α	β	γ
	5, 2cm		30°	60°	
1, 9cm	18, 1cm			90°	
		10, 2cm	90°		38°
12, 3cm				90°	63°

b) Calculate the missing side lengths under each of the given assumptions.

- i. $a = 8mm$; $b = 8,4mm$; $\beta = 90^\circ$
- ii. $b = 3,5m$; $c = 6,75m$; $\gamma = 90^\circ$
- iii. $a = 3,4m$; $\beta = 0,18\pi$; $\alpha = \frac{\pi}{2}$
- iv. $\alpha = 27,4^\circ$; $\beta = 45,9^\circ$; $c = 8,3cm$
- v. $a = 6,7mm$; $\alpha = 0,4241$; $\beta = 0,8325$
- vi. $a = 7,2cm$; $b = 5,1cm$; $\gamma = 37^\circ$

3. Use the trigonometric identities known from the lecture to simplify the following expressions:

a) $\frac{\sin(2\alpha)}{1 + \cos(2\alpha)}$

b) $(1 + \cos(2\alpha))(1 - \sqrt{1 - \sin^2(2\alpha)})$

4. Express $\sin(x + y + z)$ using $\sin(x)$, $\sin(y)$, $\sin(z)$, $\cos(x)$, $\cos(y)$, $\cos(z)$. (Hint: $x + y + z = (x + y) + z$.)