



## 3055 BA SANGAM COLLEGE

PH: 6674003/9264117 E-mail: basangam@connect.com.fj



### WORKSHEET 26

School: Ba Sangam College

Year / Level: 11

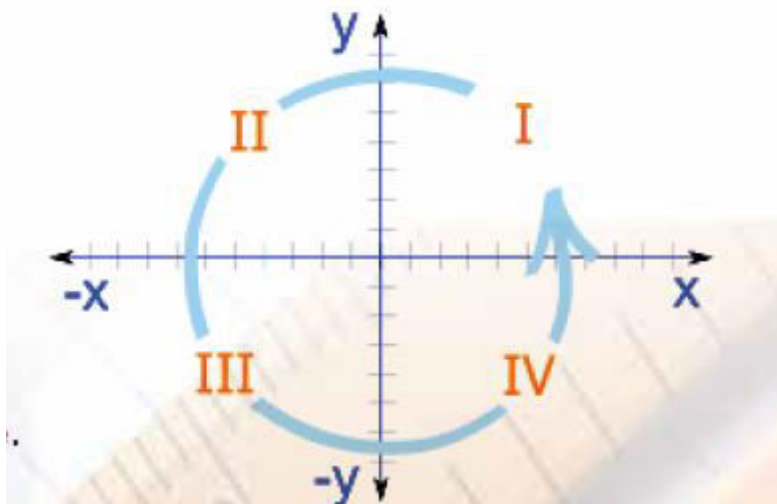
Subject: Mathematics

Name of Student: \_\_\_\_\_

Strand	TRIGONOMETRY
Sub strand	TRIGONOMETRIC EQUATIONS
Content Learning Outcome	students to be able to solve trigonometric equations

### Sine, Cosine and Tangent in Four Quadrants

The three main functions in trigonometry are Sine, Cosine and Tangent



Quadrant I	Quadrant II	Quadrant III	Quadrant IV
All are positive (Sine, Cosine and Tangent)	Sine is positive (Cosine and tangent are negative)	Tangent is positive (Sine and Cosine are negative)	Cosine is positive (Sine and Tangent are negative)

#### TO REMEMBER:

Add Sugar to Coffee

#### Example 1: Solve $\sin \theta = 0.5$

We get the first solution from the calculator =  $\sin^{-1}(0.5) = 30^\circ$  (it is in Quadrant I)  
The other solution is  $180^\circ - 30^\circ = 150^\circ$  (Quadrant II)

Hence the two values of  $\theta$  are  $30^\circ$  and  $150^\circ$

#### Example 2: Solve $\tan \theta = -1.3$

We get the first solution from the calculator =  $\tan^{-1}(-1.3) = -52.4^\circ$

This is less than  $0^\circ$ , so we add  $360^\circ$ :  $-52.4^\circ + 360^\circ = 307.6^\circ$  (Quadrant IV)

The other solution is  $307.6^\circ - 180^\circ = 127.6^\circ$  (Quadrant II)

**Example 3: Solve  $\cos \theta = -0.85$**

We get the first solution from the calculator =  $\cos^{-1}(-0.85) = 148.2^\circ$  (Quadrant II)

The other solution is  $360^\circ - 148.2^\circ = 211.8^\circ$  (Quadrant III)

**Example 4: Solve  $\sin (x + 10) = 0.5$  for  $0 \leq x \leq 360$**

$$(x + 10) = 30^\circ$$

There are two values for  $(x + 10)$  that satisfy the equation; they are  $30^\circ$  and  $150^\circ$ .

$$x + 10 = 30^\circ \text{ or } x + 10 = 150^\circ$$

$$x = 20^\circ \text{ or } x = 140^\circ$$

**EXERCISES**

Solve the following trigonometric equations:

1.  $2 \sin x = 1$

(2 Marks)

2.  $\sin x = 0.25$

(2 Marks)

3.  $2 \cos \theta = 1$

(2 Marks)

**The End**