University of Bahrain Department of Mathematics MATHS101: Calculus I Dr. Abdulla Eid



## Worksheet: Review of trigonometric functions

Students' Name: \_\_\_\_\_

1. Fill in the following table

Degree	0°	30°		60°	90°	120°		180°	270°	360°
Radian			$\frac{\pi}{4}$				$\frac{3\pi}{4}$			

2. Fill in the following table using a calculator

θ	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	$\frac{2\pi}{3}$	$\frac{3\pi}{4}$	$\frac{5\pi}{6}$	π	$\frac{3\pi}{2}$	2π
$\sin \theta$					~ ~	10	,				
$\cos \theta$				$\sim$	6						
		$\langle$	<u>)</u> ¢.	7	,	<u>.</u>		<u>.</u>			

- 3. (At home) In this exercise, you should prove that the sine function is continuous.
  - 1. Prove that f is continuous at a if and only if

$$\lim_{h \to 0} f(a+h) = f(a)$$

2. Use the trigonometric identities to show that

$$\lim_{h \to 0} \sin(a+h) = \sin(a)$$

and use the exercise above to show that  $f(x) = \sin x$  is a continuous function. Do the same for the  $f(x) = \cos x$ .

4. Find  $\lim_{\theta \to 0} \frac{\tan \theta}{\theta}$ 



6. For which value(s) of *k* is the function defined by

$$f(x) = \begin{cases} \frac{\sin(2x)}{x}, & x < 0\\ \cos x + x^2 + 4k, & x \ge 0 \end{cases}$$

continuous at x = 0?