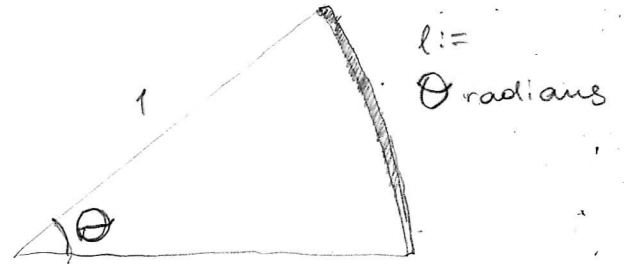
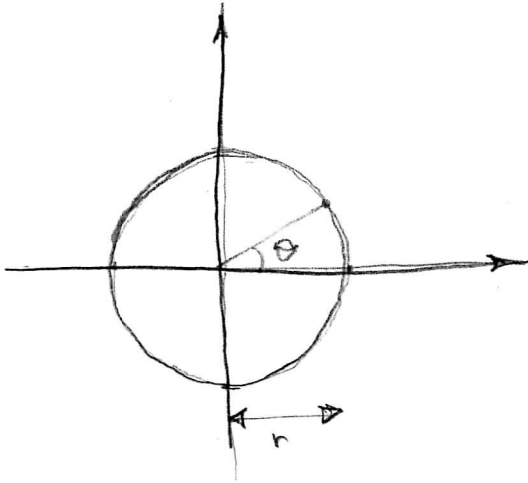


MAT157:
RADIANS & FUNCTIONS II

20160926

RADIANS

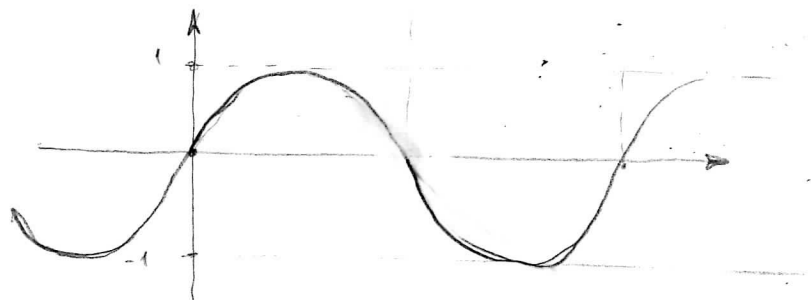
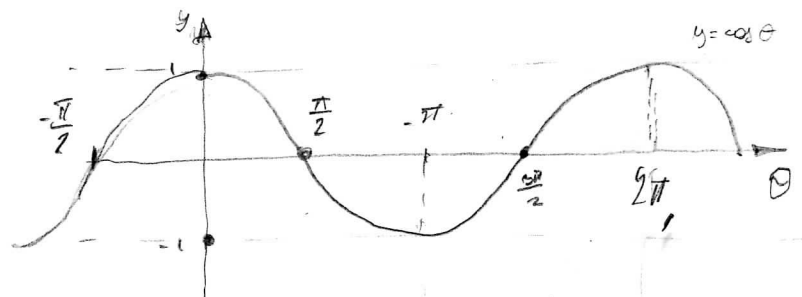
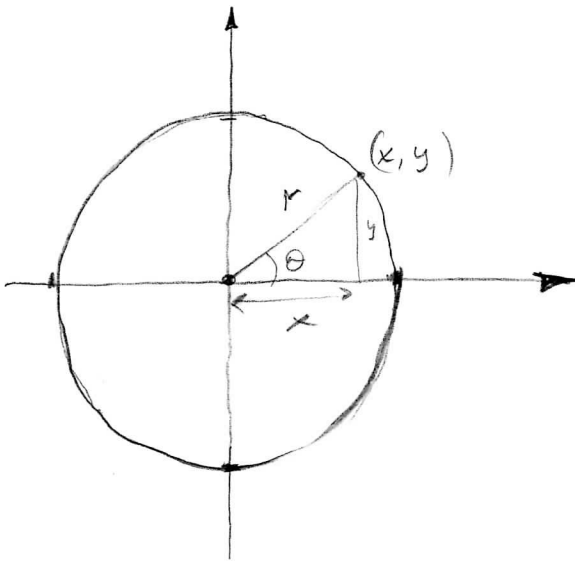
→ BABYLONIANS



CIRCUMFERENCE OF
THE UNIT CIRCLE = 2π

$$90^\circ = \frac{\pi}{2}$$

$$\theta^\circ = \frac{\pi}{180} \theta$$



FUNCTIONS ||

DEFINITION:

$\forall f(x), g(x)$:
WELL-DEFINED

$$(f+g)(x) = f(x) + g(x)$$

$$(f \cdot g)(x) = f(x) \cdot g(x)$$

$$\left(\frac{1}{f}\right) = \frac{1}{f(x)}, \text{ if } f(x) \neq 0.$$

"IDENTITY FUNCTION:

$$I(x) = x$$

CONSTANT FUNCTION:

$$f(x) = c, \forall x$$

POLYNOMIALS:

$$f(x) = \sum_{i=1}^n a_i x_i, \text{ where } a_i \in \mathbb{R},$$

$+ a_0$

RATIONAL FUNCTIONS:

$$\frac{p(x)}{q(x)}, \text{ where } p(x), q(x) \text{ POLYNOMIALS, } q(x) \neq 0$$

INTERVALS:

If $a, < b$, $[a, b] = \{x \in \mathbb{R} \mid a \leq x \leq b\}$
→ CLOSED INTERVAL



$$(a, b) = \{x \in \mathbb{R} \mid a < x < b\}$$

→ OPEN INTERVAL



THE DOMAIN OF $f(x)$ IS THE SET OF ALL x AT WHICH $f(x)$ IS DEFINED.

A POLYNOMIAL IS UNDERSTOOD TO HAVE A DOMAIN \mathbb{R} .

A RATIONAL NUMBER IS UNDERSTOOD TO HAVE ITS DOMAIN EQUAL TO \mathbb{R} OMITTING THE POINTS WHERE DENOMINATOR IS 0.

HOWEVER,
IF WE DEFINE

$$f(x) = x^3 - 4x + 7 \quad \forall x \in [-1, 3]$$

THEN ITS DOMAIN IS $[-1, 3]$.

EXAMPLE

$$\frac{x^2 - 4}{x - 2} = x + 2 \quad \text{WRONG!}$$

$$\frac{x^2 - 4}{x - 2} = x + 2, x \neq 2 \quad \text{CORRECT}$$

EXAMPLE

$$f(x) = \sin\left(\frac{1}{x}\right), x \neq 0$$

