MTHS 100

DOUBLE TUTORIAL 9

First Hour

Question 1. Which of the following function a rational function?

(a) $y = \sqrt[4]{x}$,

(b) $y = \dfrac{1}{x}$,

(c) $y = 2x^2 - 3x + 4$,

(d) $y = \dfrac{1-x}{\sqrt{x}}$,

(e) $\dfrac{1}{7}x + \sqrt{7}$,

(f) $y = x$.

Question 2. Solve the following equations for x.

(a) $\dfrac{x-6}{2x+1} = 0$,

(b) $\dfrac{x^2+2x+1}{x+1} = 0$.

Question 3. For each function from Q2 find the intervals where the function is negative/positive.

Question 4. For the rational function $y = \dfrac{x(x+2)}{x^2-1}$ find zeros, asymptotes, intervals where the function is negative/positive, and sketch (very roughly!) the graph on the domain $[-4, 2]$. Compare the result with the graph sketched by WolframAlpha: https://www.wolframalpha.com

Second Hour

Question 1.

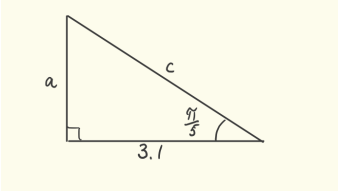
(a) What is the right angle in degrees and in radians?

(b) What is the angle in radians?
(i) 180°, (ii) 45°, (iii) 60°, (iv) 73°.

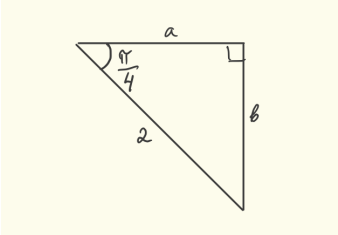
(b) What is the angle in degrees?
(i) $\frac{\pi}{6}$, (ii) $\frac{3\pi}{4}$, (iii) 1 radian, (iv) 2.5 radians.

Question 2. For the following right triangles

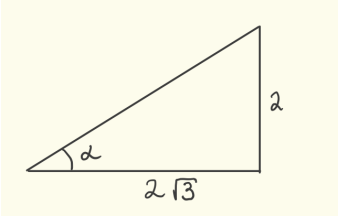
(a) find the lengths of sides a and c



(b) find the lengths of sides a and b



(c) find angle α in radians and in degrees.



Question 3. Sketch the unit circle. Mark the following angles on the sketch (a) 0, (b) $\frac{\pi}{3}$, (c) $\frac{2\pi}{3}$, (d) π (e) $\frac{4\pi}{3}$, (f) $\frac{5\pi}{3}$, (g) 2π, (h) $\frac{7\pi}{3}$, (i) $\frac{8\pi}{3}$.
Write out the values for sin, cos, and tan for each of these angles.

Question 4. Write out all angles with
(a) $\cos x = 0$, (b) $\sin x = \frac{1}{2}$, (c) $\tan x = -1$.
Use a correct notation.

Question 5. Given that $\cos t = \frac{1}{3}$ and $\sin t = \frac{2\sqrt{2}}{3}$, fill out the following table. For this first sketch the unit circle and mark angles t, $t+\frac{\pi}{2}$, $t+\pi$, $t+\frac{3\pi}{2}$, and $t+2\pi$ on the unit circle.

	t	$t+\frac{\pi}{2}$	$t+\pi$	$t+\frac{3\pi}{2}$	$t+2\pi$
cos	$\frac{1}{3}$				
sin	$\frac{2\sqrt{2}}{3}$				
tan					