

King Fahd University of Petroleum and Minerals
Prep-Year Math Program
Math 002 - Term 072
WORKSHEET (5.5 – 6.2)

Question1

Sketch the graph of $y = -\left|2\sin\frac{2}{3}x\right|$ over one period.

Question2

For the function $y = -\cos\left(3x + \frac{\pi}{2}\right) + 2$

- a) Find the amplitude, the period, the phase shift, the vertical translation, and the range.
- b) Graph the function over one complete period.

Question3

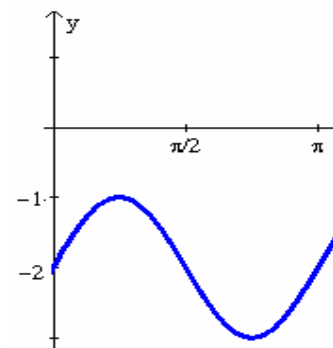
Consider the function $f(x) = 2\cot\left(\frac{x}{2} - \frac{\pi}{8}\right)$

- a) Find the period of $f(x)$
- b) Find the equation of all vertical asymptotes over the interval $\left[0, \frac{9\pi}{4}\right]$.
- c) Find the x -intercepts over the interval $\left[0, \frac{9\pi}{4}\right]$.

Question4

The graph is the graph of the equation $f(x) = a\sin(bx + c) + d$

Find $a + b + c + d$



Question5

Verify the following identities:

$$a) \frac{\sin x}{\cos x + 1} + \frac{\cos x + 1}{\sin x} = 2 \csc x$$

$$b) \frac{1}{1 - \sin x} = \sec^2 x + \sec x \tan x$$

Question6 6.2

Given $\cos \alpha = \frac{15}{17}$, α in quadrant IV, and $\sin(\beta) = \frac{-3}{5}$, β in quadrant III, find the exact value of $\tan(\alpha - \beta)$.

Question7 6.2

Find the exact value of the following expressions:

$$a) \cos 105^\circ$$

$$b) \cos 100^\circ \sin 70^\circ - \sin 100^\circ \sin 20^\circ$$

$$c) \frac{1 - \tan 29^\circ \cot 59^\circ}{\tan 29^\circ + \cot 59^\circ}$$

Question8 6.2

Show that $\left(\cos \frac{4\pi}{9} - \cos \frac{\pi}{9}\right)^2 + \left(\sin \frac{4\pi}{9} - \sin \frac{\pi}{9}\right)^2 = 1$.