NAME:_____ DATE: 02/21/2017 all non-calc

ASSIGNMENT: Trigonometric John Cusack Identities

Let $f(x) = \frac{1}{2}\cos^3 2x$

a. Write down the period and range of the function $f(x)$ *[3 marks]*

b. Consider $f(x) = -\frac{1}{16}$, $0 \le x \le \pi$. Write down the value(s) of x that satisfies the equation. *[4 marks]*

c. Find the values of x for which the function $f(x)$ is maximum and minimum. *[4 marks]*

[Maximum mark: 7]

Solve $\cos 2x - 3\cos x - 3 - \cos^2 x = \sin^2 x$, for $0 \le x \le 2\pi$.

Trigonometric identity	$\tan\theta = \frac{\sin\theta}{\cos\theta}$
Pythagorean identity	$\cos^2\theta + \sin^2\theta = 1$
Double angle formulae	$\sin 2\theta = 2\sin\theta\cos\theta$
	$\cos 2\theta = \cos^2\theta - \sin^2\theta = 2\cos^2\theta - 1 = 1 - 2\sin^2\theta$

Given that $\cos 2x = -\frac{7}{25}$ for $0° < x < 360°$ and x is **obtuse** angle,

a. Show that $\sin x = \frac{4}{5}$ *[3 marks]*

Solve $\tan^2 2\theta = 1$, in the interval $-\frac{\pi}{2} \leq \theta \leq \frac{\pi}{2}$.

Consider the function $f(x) = \cos x + \sin x$.

(a) (i) Show that $f(-\frac{\pi}{4}) = 0$.

(ii) Find in terms of π, the smallest **positive** value of x which satisfies $f(x) = 0$.

[3 marks]