MHF4U – AM Test Chapter 7: Trig Functions & Equations NAME:

KNOW	APPS	THINK	COMM	TOTAL
/12	/14	/10	/8	/44

Read every question and instruction carefully. All work must be shown to receive full marks. <u>All answers should be rationalized, simplified, and written in exact forms, unless otherwise stated. Where necessary, round answers to 4 decimal places.</u>

PART A – Fill in the blanks.

1) Write an equivalent expression for the following in radian exact form: [K3]

a) $\sin\frac{\pi}{5} = \cos$_____ b) $2\cos^2(\frac{\pi}{14}) - 1 = \cos$_____ c) $\frac{1}{4}\sin\frac{1}{3}\theta\cos\frac{1}{3}\theta =$ _____$\sin($_____$)$

2) Express each as a function of the <u>related acute angle</u>, where $0 \le \theta \le 2\pi$.
Include a well-labelled diagram. [K2,C2]

a) $\sin\left(\frac{21\pi}{25}\right) =$ _____ b. $\tan\left(-\frac{7\pi}{8}\right) =$ _____

PART B – Give full solution. Show all your work.

3) Write an equivalent expression. [K3,T3]

a) $\sin(2\pi - x) =$ b) $\tan(-x) =$ c) $\cos\left(\frac{\pi}{2} + x\right) =$

4) Determine the **exact value** of:

a) $\cos 15^\circ$ [K2]

All answers should be rationalized, simplified, and written in exact forms, unless otherwise stated. Where necessary, round answers to 4 decimal places.

b) $\cot\frac{7\pi}{12}$ [K2, C2]

5) Solve for x where $0 \le x \le 2\pi$

a) $4\sec x + 2 = 7 + 2\sec x$ [A3]

b) $\sin x - \sqrt{3}\sin x\cos x = 0$ [A3]

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c) $6\cos^2 x - 2 = -5\sin x$ [A4]

6) Solve $4\,sin^2(2x) - 3 = 0, \quad 0 \leq x \leq \pi$ [T5]

All answers should be rationalized, simplified, and written in exact forms, unless otherwise stated. Where necessary, round answers to 4 decimal places.

7) Determine the **exact values** of $\csc 2x$ and $\tan(x-y)$ given $sin\,x = \frac{7}{25}, \frac{\pi}{2} \leq x \leq \pi$ and $cos\,y = \frac{12}{13}, \ \frac{3\pi}{2} \leq y \leq 2\pi$. Include well-labelled diagrams. [A4, C2]

8) Why do the solution(s) to the equation $\cos^2 x = \frac{3}{4}$ lie in all four quadrants? *DO NOT SOLVE*. Explain your answer. [C2,T2]