Name:
Group 1
Result:

1. *(7 points)*

Solve the following equations:

a) $\sin^2\theta + \sin\theta = \cos^2\theta$, where $0 \leqslant \theta \leqslant 2\pi$,

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b) $\tan^2 3\theta = 3$, where $0 \leqslant \theta \leqslant \pi$,

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c) $3\sec^2 2\theta + 5\sec 2\theta = 2$, where $0 \leqslant \theta \leqslant 2\pi$.

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2. *(2 points)*

Calculate:

$$\frac{\cos\left(\frac{5\pi}{6}\right)\cdot\tan\left(\frac{11\pi}{4}\right)}{\sin\left(\frac{19\pi}{6}\right)\cdot\cos\left(-\frac{7\pi}{3}\right)} =$$

3. *(3 points)*

Given that $\pi < \alpha < 2\pi$ and $\tan\alpha = \frac{1}{2}$ find the values of all 5 of the remaining trigonometric functions.

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4. *(4 points)*

Prove the following trigonometric identities:

a)

$$\frac{\cos\alpha + \tan\alpha}{\sin\alpha\cos\alpha} \equiv \csc\alpha + \sec^2\alpha$$

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b)

$$\frac{\cos\beta}{1+\sin\beta} + \frac{\cos\beta}{1-\sin\beta} \equiv \frac{2}{\cos\beta}$$