Name:
Group 2
Result:

1. *(7 points)*

Solve the following equations:

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

---

b) $\tan^2 3\theta = \frac{1}{3}$, where $0 \leqslant \theta \leqslant \pi$,

---

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

---

2. *(2 points)*

Calculate:

$$\frac{\cos\left(\frac{2\pi}{3}\right)\cdot\tan\left(\frac{15\pi}{4}\right)}{\sin\left(\frac{17\pi}{6}\right)\cdot\cos\left(-\frac{13\pi}{6}\right)} =$$

3. *(3 points)*

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

---

4. *(4 points)*

Prove the following trigonometric identities:

a)

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

---

b)

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