Mathematics AA - IB_1

Test 4
subject: *Trigonometry I*

Wednesday 5 fev 2025

Problem 1 (without calculator) *[10 marks]*

Assuming θ is in the *third* sector, and $\cos(\theta) = -\sqrt{\frac{4}{7}}$, give the exact expression for

i) $\sin(\theta)$, **ii)** $\tan(\theta)$, **iii)** $\cos(2\theta)$, **iv)** $\sin(2\theta)$, **v)** $\tan(2\theta)$

Problem 2 (without calculator) *[13 marks]*

Solve the following trigonometric equations:

1) $\sin(3x) = \frac{\sqrt{3}}{2}$ *for* $0 \leqslant x < 360^0$ *[4 marks]*

2) $\cos(4x) = \frac{\sqrt{2}}{2}$ *for* $0 \leqslant x < 2\pi$ *(*radian*)* *[4 marks]*

3) $6\sin(x) - 4\cos^2(x) = 0$, for $0 \leqslant x < 3\pi$ *(radian)* *[5 marks]*

Problem 3 (with or without calculator) *[8 marks]*

Consider the trigonometric equation $5\cos(2\theta) + 3\cos(\theta) - 2 = -3$

i) Show it can be written as

$a\cos^2(\theta) + b\cos(\theta) + c = 0$ *(find a, b, c)* *[4 marks]*

ii) Hence find the solutions of this equation, for $0 \leqslant x < 2\pi$ (radian) *[4 marks]*