3 **(a)** Write $3+2\lg a-4\lg b$ as a single logarithm to base 10. [4]

(b) Solve the equation $3\log_a 4+2\log_4 a=7$. [5]

4 Solve the equation $\cot\left(2x+\frac{\pi}{3}\right)-\sqrt{3}=0$, where $-\pi < x < \pi$ radians. Give your answers in terms of π. [4]

5 Find the possible values of the constant c for which the line $y = c$ is a tangent to the curve $y = 5\sin\frac{x}{3}+4$. [3]

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