King Fahd University of Petroleum and Minerals

Quiz: 2 Math 102 Semester: 142 Duration: 45 minutes

Full Name: ID:

Section: Serial number:

Question 1 Find the slope of the tangent line to the curve $y = \ln(\cosh x) - \frac{1}{2}\tanh^2 x$ at $x = \ln 2$. (Write your answer in the form $\frac{p}{q}$)

Question 2 Given that $\coth^2 x = \frac{25}{16}$ for $x < 0$. Find $\sinh(2x)$ for $x < 0$.

Question 3 Evaluate the following integrals:

a) $\int_0^{\frac{\pi}{10}} \sin(5x)\sqrt{2\cos(2x)\cos(3x) - \cos(x)}\, dx$

b) $\int \csc^{12}(2x)\cot^{3}(2x)\,dx$

c) $\int \cos^{7}(2x+\frac{\pi}{2})\,\sin^{3}(4x)\,dx$

d) $\int \tan^{3} x\,dx$

e) $\int \mathrm{e}^{x \ln 5}\, dx$

f) $\int (x^2+1)\,\mathrm{sech}(\ln x)\, dx$

g) $\int x\Big(\log_2 x^3\Big)^2\, dx\,.$