- Show all your work for each problem; show enough work to fully justify your answer.
- Simplify all answers as far as possible.

(1) [Points: 10] Let $f(x) = \sin 3x \cos^3 3x \tan 3x$.
    (a) Simplify $f(x)$ as far as possible.

    (b) Differentiate $f(x)$.

(2) [Points: 10] Evaluate:
    (a) $\sin^{-1}(\sin \frac{3}{4}\pi)$.

    (b) $\sin(\sin^{-1} \frac{3}{4})$.

(3) [Points: 5] Evaluate $\frac{d}{dx} \tan^{-1} x^2$.