

(1) For this question let $f(x) = \frac{1}{\sqrt{1+3x}}$

(i) Determine $T_1(x)$, the linear approximation to f at $a = 0$.

[3]

(ii) Use your approximation to estimate $f(1/6)$. State your answer as a single simplified fraction.

[3]

(iii) Determine an error bound on your approximation in part (ii). Again, state your answer as a single simplified fraction.

[4]

(2) Let $f(x) = \cos(2x)$. Find $T_3(x)$, the Taylor polynomial of degree 3 about $a = \pi/4$. Simplify any fractions in your final answer.