

(1) For this question let  $f(x) = \frac{1}{x+2}$

(i) Determine  $T_1(x)$ , the linear approximation to  $f$  at  $a = 2$ .

[3]

(ii) Use your approximation to estimate  $f(3/2)$ . 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  $f(x) = x^2 \ln(x)$ . Find  $T_2(x)$ , the Taylor polynomial of degree 2 about  $a = 1$ . Simplify any fractions in your final answer.