2. [Maximum mark: 6]

Let \( f(x) = x^2 \) and \( g(x) = 3 \ln(x + 1) \), for \( x > -1 \).

(a) Solve \( f(x) = g(x) \). [3]

(b) Find the area of the region enclosed by the graphs of \( f \) and \( g \). [3]
Section A

1. (a) 

Note: Award A1 for vertical line clearly to right of mean, A1 for shading to left of their vertical line.

(b) \[ P(X \leq 25) = 0.894350 \] (A1)

\[ P(X \leq 25) = 0.89 \text{ (must be 2 d.p.)} \] A1 N2 [2 marks]

(c) \[ c = 22.0976 \]
\[ c = 22.1 \] A2 N2 [2 marks]

Total [6 marks]

2. (a) valid approach (M1)

\[ eg \text{ sketch} \]
\[ 0, 1.73843 \]
\[ x = 0, x = 1.74 \text{ (accept } (0, 0) \text{ and } (1.74, 3.02) \text{)} \] A1A1 N3 [3 marks]

(b) integrating and subtracting functions (in any order) (M1)

\[ eg \int g - f \text{ (in any order)} \]

correct substitution of their limits or function (accept missing \( dx \)) (A1)

\[ eg \int_{0}^{1.74} g - f, \int 3 \ln(x+1) - x^2 \]

Note: Do not award A1 if there is an error in the substitution.

\[ 1.30940 \] A1 N3 [3 marks]

\[ 1.31 \]

Total [6 marks]