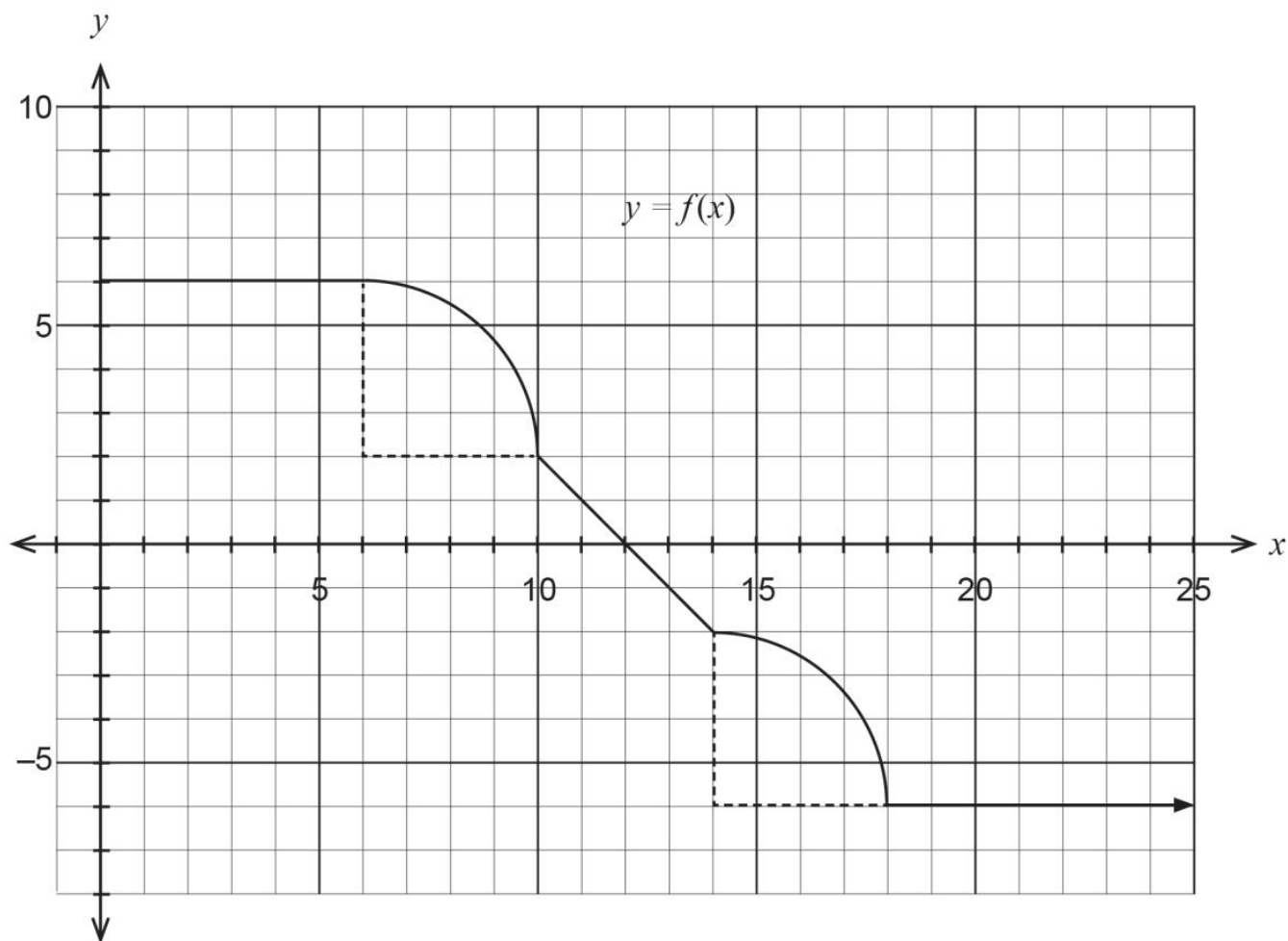


Question 7

(7 marks)

Consider the graph $y = f(x)$. Both arcs have a radius of four units.



Using the graph of $y = f(x)$, $x \geq 0$, evaluate exactly the following integrals.

(a) $\int_0^{12} f(x) \, dx$

(3 marks)

(b) $\int_0^{18} f(x) \, dx$

(2 marks)

(c) Determine the value of the constant α such that $\int_0^{\alpha} f(x) \, dx = 0$. There is no need to simplify your answer. (2 marks)