

14. (a) Find

$$\int \frac{5x(5x - 6) - 9}{2\sqrt{x}} dx$$

giving each term in simplest form.

(4)

Given that

$$\int_1^k \frac{5x(5x - 6) - 9}{2\sqrt{x}} dx < 6\sqrt{k} + 14$$

where  $k$  is a constant,  $k > 2$

(b) (i) show that

$$k^2 - 2k - 3 < 0$$

(ii) Hence find the range of values of  $k$

(5)