1. **In this question you must show all stages of your working.**

Solutions relying on calculator technology are not acceptable.

(a) Show that, for $r \geqslant 2$

$$\frac{2}{\sqrt{r}+\sqrt{r-2}} = \sqrt{r} - \sqrt{r-2}$$

(2)

(b) Hence use the method of differences to determine

$$\sum_{r=2}^{n} \frac{2}{\sqrt{r}+\sqrt{r-2}}$$

giving your answer in simplest form.

(3)

(c) Hence show that

$$\sum_{r=4}^{50} \frac{2}{\sqrt{r}+\sqrt{r-2}} = A + B\sqrt{2} + C\sqrt{3}$$

where A, B and C are integers to be determined.

(2)

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Question 1 continued

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Question 1 continued

(Total for Question 1 is 7 marks)