(a) (i) Given that $x-\sqrt{32}=\sqrt{128}-5 x$, find the value of $x$, where $x \in \mathbb{R}$. Give your answer in the form $a \sqrt{2}$, where $a \in \mathbb{N}$.

(ii) $\mathrm{A}=\left\{\sqrt{32 k^{2}}, \sqrt{50 k^{2}}, \sqrt{128 k^{2}}, \sqrt{98 k^{2}}\right\}$, where $k \in \mathbb{N}$.

Show that the mean of $\operatorname{set} A$ is equal to the median of $\operatorname{set} A$.

|  |  |  |  | Mean |  |  |  |  |  |  |  |  |  | Median |  |  |  |  |  |  |
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(b) Prove, using contradiction, that $\sqrt{2}$ is not a rational number.


