**Expanding Brackets with Surds**

(a) Show that $(5-\sqrt{12})(2+\sqrt{3})$ can be written in the form $a+\sqrt{b}$ where $a$ and $b$ are integers.

(b) Show that $(6+\sqrt{2})(\sqrt{8}-4)$ can be written in the form $a\sqrt{2}+b$ where $a$ and $b$ are integers.

(c) Show that $\sqrt{3}(\sqrt{12}-2)^{2}$ can be written in the form $a\sqrt{3}+b$ where $a$ and $b$ are integers.

(d) Show that $\left(5+\sqrt{5}\right)\left(\sqrt{20}-2\right)\left(3-\sqrt{5}\right)$ can be written in the form $a\sqrt{5}+b$ where $a$ and $b$ are integers.

(e) Show that $(1+\sqrt{8})^{3} $can be written in the form $p+\sqrt{q}$ where $p$ and $q$ are integers.

(f) Given that

$$\left(a+\sqrt{6}\right)\left(10-\sqrt{6}\right)=24+b\sqrt{6}$$

find the values of the integers $a$ and $b$.

(g) Given that

$$\left(5-\sqrt{8}\right)\left(3-a\sqrt{2}\right)=b-21\sqrt{2}$$

find the values of the integers $a$ and $b$.

(h) Given that

$$\left(p+2\sqrt{q}\right)^{2}=40+16\sqrt{q}$$

find the values of the integers $p$ and $q$.

(i) Express $\left(6+\sqrt{3}\right)\left(a-2\sqrt{3}\right)\left(4-\sqrt{12}\right)$

in the form $b-76\sqrt{3}$ where $a$ and $b$ are integers to be found.

(j) Given that

 $\left(p+\sqrt{q}\right)\left(p-3\sqrt{q}\right)=13-14\sqrt{q}$

find the values of the integers $p$ and $q$.

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