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.

(a) $4+\sqrt{3}$ $a=4, b=3$

(b) $8\sqrt{2}-20$ $a=8, b=-20$

(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 $(5+\sqrt{5})(\sqrt{20}-2)(3-\sqrt{5})$ 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.

(c) $16\sqrt{3}-24$ $a=16, b=-24$

(d) $24\sqrt{5}-40$ $a=24$ $b=-40$

(e) $25+22\sqrt{2}$ $p=25$
$=25+\sqrt{968}$ $q=968$

(f) Given that

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

find the values of the integers a and b.

(g) Given that

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

find the values of the integers a and b.

(f) $a=3, b=7$

(g) $a=3, b=27$

(h) Given that

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

find the values of the integers p and q.

(i) Express $(6+\sqrt{3})(a-2\sqrt{3})(4-\sqrt{12})$ in the form $b-76\sqrt{3}$ where a and b are integers to be found.

(j) Given that

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

find the values of the integers p and q.

(h) $p=4, q=6$

(i) $a=5, b=138$

(j) $p=7, q=12$