

1 Write $\frac{3\sqrt{3}}{4-\sqrt{3}} - \frac{2}{\sqrt{3}}$ in the form $\frac{a\sqrt{3}+b}{c}$ where a , b and c are integers.

cross multiply to get the same denominator

$$\frac{3\sqrt{3}(\sqrt{3}) - 2(4-\sqrt{3})}{(4-\sqrt{3})(\sqrt{3})} \text{ expands to } \frac{9-8+2\sqrt{3}}{4\sqrt{3}-3} \quad \checkmark \textcircled{1}$$

$$\frac{1+2\sqrt{3}}{4\sqrt{3}-3} \times \frac{4\sqrt{3}+3}{4\sqrt{3}+3} \text{ rationalise} \quad \frac{(1+2\sqrt{3})(4\sqrt{3}+3)}{(4\sqrt{3}-3)(4\sqrt{3}+3)} \text{ expands to } \frac{4\sqrt{3}+3+24+6\sqrt{3}}{48-9} \quad \checkmark \textcircled{1}$$

collect like terms: $\frac{10\sqrt{3}+27}{39}$ in $\frac{a\sqrt{3}+b}{c}$ form

$$\frac{10\sqrt{3}+27}{39} \quad \checkmark \textcircled{1}$$

(Total for Question 1 is 4 marks)