



SURDS

NO CALCULATOR

Ref: G184. **2S1**

MULTIPLYING TWO-PART SURDS

<p>A1 Expand $\sqrt{2} \times (3 + \sqrt{2})$ Give your answer in the form $a + b\sqrt{2}$ where a and b are integers.</p>	<p>A2 Expand $\sqrt{3} \times (7 - \sqrt{3})$ Give your answer in the form $a + b\sqrt{3}$ where a and b are integers.</p>	<p>A3 Expand $\sqrt{2} \times (3 + 2\sqrt{2})$ Give your answer in the form $a + b\sqrt{2}$ where a and b are integers.</p>	<p>A4 Expand $\sqrt{3} \times (5 + 4\sqrt{3})$ Give your answer in the form $a + b\sqrt{3}$ where a and b are integers.</p>
<p>B1 Expand $(5 + \sqrt{2})(2 + \sqrt{2})$ Give your answer in the form $a + b\sqrt{2}$ where a and b are integers.</p>	<p>B2 Expand $(2 + \sqrt{3})(5 - \sqrt{3})$ Give your answer in the form $a + b\sqrt{3}$ where a and b are integers.</p>	<p>B3 Expand $(4 + \sqrt{3})(1 + 2\sqrt{3})$ Give your answer in the form $a + b\sqrt{3}$ where a and b are integers.</p>	<p>B4 Expand $(3 - \sqrt{5})(2 - 2\sqrt{5})$ Give your answer in the form $a + b\sqrt{5}$ where a and b are integers.</p>
<p>C1 Expand $(1 + \sqrt{5})^2$ Give your answer in the form $a + b\sqrt{5}$ where a and b are integers.</p>	<p>C2 Expand $(3 + \sqrt{7})^2$ Give your answer in the form $a + b\sqrt{7}$ where a and b are integers.</p>	<p>C3 Expand $(6 - \sqrt{3})^2$ Give your answer in the form $a + b\sqrt{3}$ where a and b are integers.</p>	<p>C4 Expand $(4 + 3\sqrt{2})^2$ Give your answer in the form $a + b\sqrt{2}$ where a and b are integers.</p>
<p>D1 Expand $(1 + \sqrt{2})(3 + \sqrt{8})$ Give your answer in the form $a + b\sqrt{2}$ where a and b are integers.</p>	<p>D2 Expand $(7 - \sqrt{5})(2 + \sqrt{20})$ Give your answer in the form $a + b\sqrt{5}$ where a and b are integers.</p>	<p>D3 Expand and simplify $(5 + \sqrt{6})(5 - \sqrt{6})$</p>	<p>D4 Expand and simplify $(3 + 2\sqrt{5})(\sqrt{20} - 3)$</p>



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<p>A1 Expand $\sqrt{2} \times (3 + \sqrt{2})$</p> $= 3\sqrt{2} + 2$ $= 2 + 3\sqrt{2}$	<p>A2 Expand $\sqrt{3} \times (7 - \sqrt{3})$</p> $= 7\sqrt{3} - 3$ $= -3 + 7\sqrt{3}$	<p>A3 Expand $\sqrt{2} \times (3 + 2\sqrt{2})$</p> $= 3\sqrt{2} + 2 \times 2$ $= 4 + 3\sqrt{2}$	<p>A4 Expand $\sqrt{3} \times (5 + 4\sqrt{3})$</p> $= 5\sqrt{3} + 4 \times 3$ $= 12 + 5\sqrt{3}$
<p>B1 Expand $(5 + \sqrt{2})(2 + \sqrt{2})$</p> <p style="text-align: center;">F O I L</p> $= 10 + 5\sqrt{2} + 2\sqrt{2} + 2$ $= 12 + 7\sqrt{2}$	<p>B2 Expand $(2 + \sqrt{3})(5 - \sqrt{3})$</p> <p style="text-align: center;">F O I L</p> $= 10 - 2\sqrt{3} + 5\sqrt{3} - 3$ $= 7 + 3\sqrt{3}$	<p>B3 Expand $(4 + \sqrt{3})(1 + 2\sqrt{3})$</p> <p style="text-align: center;">F O I L</p> $= 4 + 8\sqrt{3} + \sqrt{3} + 2 \times 3$ $= 10 + 9\sqrt{3}$	<p>B4 Expand $(3 - \sqrt{5})(2 - 2\sqrt{5})$</p> <p style="text-align: center;">F O I L</p> $= 6 - 6\sqrt{5} - 2\sqrt{5} + 2 \times 5$ $= 16 - 8\sqrt{5}$
<p>C1 Expand $(1 + \sqrt{5})^2$</p> $= (1 + \sqrt{5})(1 + \sqrt{5})$ $= 1 + \sqrt{5} + \sqrt{5} + 5$ $= 6 + 2\sqrt{5}$	<p>C2 Expand $(3 + \sqrt{7})^2$</p> $= (3 + \sqrt{7})(3 + \sqrt{7})$ $= 9 + 3\sqrt{7} + 3\sqrt{7} + 7$ $= 16 + 6\sqrt{7}$	<p>C3 Expand $(6 - \sqrt{3})^2$</p> $= (6 - \sqrt{3})(6 - \sqrt{3})$ $= 36 - 6\sqrt{3} - 6\sqrt{3} + 3$ $= 39 - 12\sqrt{3}$	<p>C4 Expand $(4 + 3\sqrt{2})^2$</p> $= (4 + 3\sqrt{2})(4 + 3\sqrt{2})$ $= 16 + 12\sqrt{2} + 12\sqrt{2} + 9 \times 2$ $= 34 + 24\sqrt{2}$
<p>D1 Expand $(1 + \sqrt{2})(3 + \sqrt{8})$</p> $= 3 + \sqrt{8} + 3\sqrt{2} + \sqrt{16}$ $= 3 + 2\sqrt{2} + 3\sqrt{2} + 4$ $= 7 + 5\sqrt{2}$	<p>D2 Expand $(7 - \sqrt{5})(2 + \sqrt{20})$</p> $= 14 + 7\sqrt{20} - 2\sqrt{5} - \sqrt{100}$ $= 14 + 7 \times 2\sqrt{5} - 2\sqrt{5} - 10$ $= 4 + 12\sqrt{5}$	<p>D3 Expand and simplify $(5 + \sqrt{6})(5 - \sqrt{6})$</p> $= 25 - 5\sqrt{6} + 5\sqrt{6} - 6$ $= 19$	<p>D4 $(3 + 2\sqrt{5})(\sqrt{20} - 3)$</p> $= 3\sqrt{20} - 9 + 2\sqrt{100} - 6\sqrt{5}$ $= 3 \times 2\sqrt{5} - 9 + 2 \times 10 - 6\sqrt{5}$ $= 11$