

## C1. Indices and Surds

$$1a) (3\sqrt{7})^2 = 63$$

$$b) (8 + \sqrt{5})(2 - \sqrt{5}) \\ 16 - 8\sqrt{5} + 2\sqrt{5} - 5 \\ 11 - 6\sqrt{5}$$

$$2 \quad 32\sqrt{2} = 2^5 \times 2^{1/2} = \underline{\underline{2^{11/2}}} \\ a = 11/2$$

$$3a) 125^{1/3} = 5$$

$$b) 125^{-2/3} = 5^{-2} = 25^{-1} = \underline{\underline{\frac{1}{25}}}$$

$$4) (\sqrt{7} + 2)(\sqrt{7} - 2) \\ 7 - 2\sqrt{7} + 2\sqrt{7} - 4 \\ 3$$

$$5) a) 2$$

$$b) (16x^{12})^{3/4} = (2x^3)^3 = \underline{\underline{8x^9}}$$

$$6) \frac{(5 - \sqrt{3})(2 - \sqrt{3})}{(2 + \sqrt{3})(2 - \sqrt{3})} \\ \frac{10 - 5\sqrt{3} - 2\sqrt{3} + 3}{4 - 2\sqrt{3} + 2\sqrt{3} - 3} \\ \underline{\underline{13 - 7\sqrt{3}}}$$

$$7a) 8^{4/3} = \underline{\underline{16}}$$

$$b) \frac{15x^{4/3}}{3x} = \underline{\underline{5x^{1/3}}}$$

$$8a) \quad \sqrt{108} = \sqrt{36} \sqrt{3} = \underline{\underline{6\sqrt{3}}}$$

$$b) \quad \begin{aligned} &(2-\sqrt{3})(2-\sqrt{3}) \\ &4 - 2\sqrt{3} - 2\sqrt{3} + 3 \\ &\underline{\underline{7 - 4\sqrt{3}}} \end{aligned}$$

$$9a) \quad \sqrt{45} = \sqrt{9} \sqrt{5} = \underline{\underline{3\sqrt{5}}}$$

$$b) \quad \begin{aligned} &\frac{2(3+\sqrt{5})(3+\sqrt{5})}{(3-\sqrt{5})(3+\sqrt{5})} \\ &\frac{2(9+3\sqrt{5}+3\sqrt{5}+5)}{9-5} \\ &\frac{2(14+6\sqrt{5})}{2\cancel{4}} \\ &\underline{\underline{7+3\sqrt{5}}} \end{aligned}$$

$$10a) \quad 2$$

$$b) \quad 8^{-2/3} = 2^{-2} = \frac{1}{4}$$

$$11a) \quad \begin{aligned} &(4+\sqrt{3})(4-\sqrt{3}) \\ &16-3 \\ &\underline{\underline{13}} \end{aligned}$$

$$b) \quad \frac{26(4-\sqrt{3})}{13} = 2(4-\sqrt{3}) = \underline{\underline{8-2\sqrt{3}}}$$

$$12a) \quad 16^{1/2} = 4$$

$$b) \quad 16^{-3/2} = 4^{-3} = 64^{-1} = \frac{1}{64}$$