

Homework Solutions

$$1 \text{ a) } \frac{2}{\sqrt{4}} = \frac{2}{2} = \underline{\underline{1}}$$

$$\text{b) } \frac{3\sqrt{5}}{\sqrt{8}} = \frac{3\sqrt{5}\sqrt{8}}{\sqrt{8}\sqrt{8}}$$

$$= \frac{3\sqrt{40}}{8}$$

$$= \frac{3\sqrt{4}\sqrt{10}}{8}$$

$$= \frac{6\sqrt{10}}{8} = \underline{\underline{\frac{3\sqrt{10}}{4}}}$$

$$\text{c) } \frac{4}{(\sqrt{3}+1)} = \frac{4(\sqrt{3}-1)}{(\sqrt{3}+1)(\sqrt{3}-1)}$$

$$= \frac{4(\sqrt{3}-1)}{3+\sqrt{3}-\sqrt{3}-1}$$

$$= \frac{4(\sqrt{3}-1)}{2}$$

$$= \underline{\underline{2(\sqrt{3}-1)}}$$

$$2. \ A = \frac{1}{2} b h$$

$$= \frac{1}{2} (\sqrt{12}+2)(\sqrt{3}+1)$$

$$= \frac{1}{2} (\sqrt{36}+\sqrt{12}+2\sqrt{3}+2)$$

$$= \frac{1}{2} (6+2\sqrt{3}+2\sqrt{3}+2)$$

$$= \frac{1}{2} (8+4\sqrt{3})$$

$$= \underline{\underline{4+2\sqrt{3}}}$$

$$3. \ \text{After pay rise: } 104\% = \underline{\underline{£1456}}$$

$$1\% = \frac{1456}{104}$$

$$\text{Before pay rise: } 100\% = \frac{1456}{104} \times 100$$

$$= \underline{\underline{£1400}}$$

$$4. \ \text{a) } 3a(a+5)-2a(a-7)$$

$$= 3a^2+15a-2a^2+14a$$

$$= \underline{\underline{a^2+29a}}$$

$$\text{b) } (b+3)(2b-4)$$

$$= [b(2b-4)+3(2b-4)]$$

$$= 2b^2-4b+6b-12$$

$$= \underline{\underline{2b^2+2b-12}}$$

$$\text{c) } (2c+4)(c^2+3c+4)$$

$$= [2c(c^2+3c+4)+4(c^2+3c+4)]$$

$$= 2c^3+6c^2+8c+4c^2+12c+16$$

$$= \underline{\underline{2c^3+10c^2+20c+16}}$$

$$5a) \quad 12x^2 - 27 = 3(4x^2 - 9) \\ = \underline{3(2x-3)(2x+3)}$$

$$b) \quad \overset{\text{sum}}{x^2} + 13x + 36 = \underline{(x+4)(x+9)}$$

x	\times	1	2	3	$+4$	6
x		36	18	$12+9$	9	6
				↑		
				$9x+4x=13x$	✓	

$$c) \quad \overset{\text{sum}}{x^2} - 14x + 24 = \underline{(x-2)(x-12)}$$

x	\times	1	-2	3	4
x		24	-12	8	6
				$-12x-2x=-14x$	✓

$$d) \quad \overset{\text{difference}}{2x^2} - 5x - 12 = \underline{(x-4)(2x+3)}$$

x	\times	1	2	3	12	6	-4
$2x$		12	6	4	1	2	$+3$
				$+3x-8x=-5x$	✓		