Percentages Ratio Proportion Time 2 Mixed Answers

1)	**(a) (i)** 14.62 final answer	**3**	**M2** for $0.85 \times 20 \times 0.86$ oe soi by 14.6(0) or **M1** for 0.85×20 soi by 17 or 0.85×0.86 soi by 0.731
	(ii) 20 www	**3**	**M2** for 16.40 /0.82 oe or **M1** for 16.40 associated with 82%
	(iii) 135 www	**2**	**M1** for $(108 \times 5)/4$
	(b) $c + 4d = 27.10$ oe	**B1**	Could use other variables but must be consistent
	$c + 7d = 34.30$ oe	**B1**	
	Elimination of one variable	**M1**	**M1** for correct elimination of one variable from their equations – condone 1 arithmetic slip
	$(c =)$ 17.5(0) and $(d =)$ 2.4(0)	**A1**	Correct answers from no working scores **SC1** only
	(c) 36 cao	**3**	**B1** for 7h 30 min or 7.5 or 450 (mins) seen and **M1** for $270/t$ where $7 \le t \le 9$
	(d) 606.744 or 606.74 or 606.7(0) or 607	**2**	**M1** for $540 \times (1.06)^2$ oe but not $(1 + 6\%)^2$ unless recovers For step by step method, must see 572.4(0) and a correct method for the second year **M0** if any further addition or subtraction
2)			
	(a) (i) 39	**2**	**B1** for (f(2) =) 6 or 6^2 seen or $(4x – 2)^2 + 3$ seen
	(ii) $\frac{8}{x} + 2$ or $\frac{8+2x}{x}$ or $\frac{2(4+x)}{x}$ or $8x^{-1} + 2$ final answer	**2**	**M1** for $4\left(\frac{2}{x}+1\right)-2$
	(b) –2.5 oe	**2**	**M1** for $2 + x = 0.2x$ oe or $\frac{2}{x} = 0.2 - 1$ or better
	(c) 2.2 oe	**2**	**M1** for $\frac{2}{5/3}$ oe $+1$ allow 1.66 to 1.67 for 5/3 or $\frac{2}{2/x}+1$
	(d) (i) $4x – 2 = \frac{2}{x} + 1$		oe with these four terms
	At least 1 intermediate step and $4x^2 – 3x – 2 = 0$	**E1**	No errors
	(ii) $\frac{-(-3) \pm \sqrt{(-3)^2 - 4(4)(-2)}}{2(4)}$	**B1** **B1**	**B1** for $\sqrt{(-3)^2 - 4(4)(-2)}$ or better (41) and in form $\frac{p+\sqrt{q}}{r}$ or $\frac{p-\sqrt{q}}{r}$ **B1** for – (–3) and 2(4) or better
	1.18 and –0.43 cao	**B1B1**	**SC1** for 1.18 and –0.43 seen or 1.2 and –0.4 or 1.17... and –0.425…

3)	**(a)** 1 min 36 s www		**3**	**M1** for $1.2 \times 0.8 \times 0.5$ (= 0.48) **A1** 1.6 or 96 If **A0**, **B1** for correctly converting to min and sec Dep on **M1**
4)	**(c) (i)** 10 31		**2**	**B1** for 43 seen
	(ii) 2 : 5 cao		**2**	**B1** for 18 : 45 oe
	(d) 34.9		**1**	
5)	Wednesday 22 15 or 10 15pm		**2**	**B1** **B1**
6)	**(a)**	15	**2**	**M1** for $\frac{(9-3)}{0.4}$ oe
	(b)	11.7(0)	**2**	**M1** for 9×1.3 oe
7)	7 cao		**3**	**B1** for 39.5(0) or 31.5(0) or 42 **M1** for (their 39.5 – 8) ÷ 4.5 or (their 42 – 10.5) ÷ 4.5
8)	**(a)**	1134	**3**	**M2** for $\frac{504}{12} \times (12+7+8)$ soi by answer of 1130 or **B1** for 27 or 42 or 294 or 336 seen
	(b) (i)	468.72	**3**	**M2** for $\frac{93}{100} \times 504$ oe soi by 468.7 or 469 or **M1** for $\frac{7}{100} \times 504$ (implied by 35.28)
	(ii)	84	**3**	**M2** for $\frac{64.68}{77} \times 100$ or **M1** for (100 –23)% = 64.68
	(c)	262.19 cao	**3**	**M2** for 250×1.016^3 oe implied by answer 262.2 or better or **M1** for 250×1.016^n oe $n > 2$ seen
	(d)	12.5%	**3**	**M2** for $\frac{324-288}{288} \times 100$ or **M1** for $\frac{324}{288} \times 100$ (112.5) or $\frac{36}{288}$ (0.125)

Percentages Ratio Proportion Time 2 Mixed Answers

9)	**(a) (i)**	[0]5 38 oe	**1**	Allow 5h 38 but not 5h 38mins
	(ii)	92.7 [92.72 to 92.73] oe	**2**	Allow $92\frac{8}{11}$ or $\frac{1020}{11}$ **M1** for 850 ÷ their 9 h 10 min in hours oe Allow 850 ÷ 9.1 for **M1**
	(b) (i)	204 or 203. 9[0] to 203.91	**3**	**M1** for 160 × 255 + 330 × 190 + 150 × 180 [130 500] **M1** dep for ÷ 640
	(ii)	640 ÷ (4 + 3 + 1) × 3 [= 240]	**M1** **M1**	[Can be in either order or shown together] Accept 240 ÷ 3 × (4 + 3 + 1) = 640 for **M2**
	(iii)	150 www 3	**3**	**M2** for 240 ÷ 1.6 oe or **M1** for recognition of 240 = 100 + 60 %
	(c)	11 cao www 3	**3**	**M1** for figs 340 or figs 550 ÷ speed [e.g. figs 188, figs 306] – can be spoiled by further work and **M1** for correct conversion of units to give answer in seconds e.g. speed = 50 m/s **M**'s independent

10)	**(a) (i)**	–4	**1**	
	(ii)	–4 –3 –1 2 5	**1**	
	(iii)	8	**1**	allow –8
	(b) (i)	1305	**1**	
	(ii)	3 (h) 35 (m) cao	**1**	
	(c)	488 km/h	**1** **1**	

11)	**(a)**	5 30 pm	**1**	
	(b)	67	**2**	**M1** for 10h45min and 3h 15min oe seen

12)	**(a) (i)**	[0]9 15 [am]	**1**	Any acceptable form of time
	(ii)	64.9 or 65.[0] or 64.92 to 64.98	**2**	**M1** for 92 ÷ (1 and 25 mins) or 92/85 × 60 oe or 92 ÷ (1.41 to 1.42)
	(iii)	11.76…or 11.8	**1**	
	(iv)	80	**3**	**M2** for 92 ÷ 1.15 oe or **M1** for 115% associated with 92
	(b) (i)	150 ÷ (11 + 16 + 3) or 150 × 3 oe then × 3 or ÷ 30	**M1** **E1**	Correct first step Correct conclusion
	(ii)	11 : 9 final answer	**2**	**M1** for 8.25 : (15 – 8.25) oe For **M1** e.g. allow 1 : 0.818 [0.8181 to 0.8182] or 1.22 : 1 [1.222…] **After M0**, **SC1** for 9 : 11 as final answer