Mark Scheme

Q1.

Question	Answer	Mark	Mark scheme	Additional guidance
	12 508.7(0)	P1	for start of process to find interest rate for year 1 eg 12336 ÷ 12000 (=1.028) **or** (12336 – 12000) ÷ 12000 (=0.028) **OR** forms a suitable equation, eg $12000 \times (1 + \frac{x}{100}) = 12336$	
		P1	for complete process to find the interest rate for year 1 eg ("1.028" – 1) × 100 (=2.8) **or** "0.028" × 100 (=2.8) **OR** correct process to solve correct equation eg (12336 – 12000) ÷ 120 (=2.8)	Rate of interest = 2.8, or x = 2.8 implies P2
		P1	for complete process to find the value at the end of 2 years eg ("2.8" ÷ 2 + 100) ÷ 100 × 12336	
		A1	accept 12508.7 to 12508.71 **or** 12509	12509 must come from correct working

(Q09 1MA1/2H, June 2018)

Q2.

Question	Answer	Mark	Mark scheme	Additional guidance
(a)	explanation	C1	explanation eg should be 1.03, this is 30% (not 3%) **Acceptable examples** Because 1.3 is 130% He is increasing it by 30% 1.3 means 1.30, not 1.03 He needs to put a 0 in front of the 3 1.3 is the wrong decimal He should multiply by 0.03 3% is 0.03, (not 1.3) His answer should be 154.5 He is meant to increase it by 4.5, not by 45 **Not acceptable examples** Because he is increasing by 130%, not 3% He needs to find 1% and then times it by 3	
(b)	(150 ×) 0.97 = 145.5	B1	for 0.97 (or $\frac{97}{100}$ or 97%) and 145.5	

(Q18 1MA1/2F, Nov 2018)

Q3.

Question	Answer	Mark	Mark scheme	Additional guidance
(a)	Ben (supported)	P1	shows how to work interest out for one year eg 2000 × 0.025 (= 50) **or** 1600 × 0.035 (= 56) **or** 150 **or** 168 **or** 2000×1.025 (= 2050) **or** 1600 × 1.035 (= 1656)	Throughout accept figures ±1 pence which do not need to be presented in money notation (to 2dp) or with monetary symbols.
		P1	shows compound interest calculation for one account eg 2050→51.25 **or** 2101.25→52.53 **or** 1656→57.96 **or** 1713.96→59.99 eg 2000×1.025^3 (= 2153.78) **or** 1600×1.035^3 (= 1773.95)	Award mark for a correct process shown, for which these figures can be taken as implying the process.
		P1	shows complete compound interest calculation for both accounts eg 2000×1.025^3 (= 2153.78) **and** 1600×1.035^3 (= 1773.95) OR one interest stated correctly eg 153.78 **or** 173.95	As above, award mark for both correct processes shown for both accounts, which these figures can be taken as implying the process.
		C1	Ben (shares) supported by 153.78 **and** 173.95	Accept an answer of "shares".

(b)	conclusion	C1	conclusion (ft) eg no change, shares now 182.5… **Acceptable examples** no since shares/Ben now 182.5 Still Ben since 182.5 > Ali No; he only gets 8.57 more No; he gets 68.56 instead of 59.98 (3rd yr) No; Ben already gets more interest, he would just get even more **Not acceptable examples** no shares now 182.5 Still Ben since less than Ali 182.5 > 153.78 no; he needs 20.17 more	Conclusion needs to be supported. ft is from part (a); calculations carried out as part of (b) need to be correct for the comparison to be valid.

(Q23 1MA1/2F, Nov 2018)

Q4.

Question	Answer	Mark	Mark scheme	Additional guidance
(a)	Ben (supported)	P1	shows how to work interest out for one year eg 2000×0.025 (= 50) **or** 1600×0.035 (= 56) **or** 150 **or** 168 **or** 2000×1.025 (= 2050) **or** 1600×1.035 (= 1656)	Throughout accept figures ±1 pence which do not need to be presented in money notation (to 2dp) or with monetary symbols.
		P1	shows compound interest calculation for one account eg 2050→51.25 **or** 2101.25→52.53 **or** 1656→57.96 **or** 1713.96→59.99 eg 2000×1.025^3 (= 2153.78) **or** 1600×1.035^3 (= 1773.95)	Award mark for a correct process shown, for which these figures can be taken as implying the process.
		P1	shows complete compound interest calculation for both accounts eg 2000×1.025^3 (= 2153.78) **and** 1600×1.035^3 (= 1773.95) OR one interest stated correctly eg 153.78 **or** 173.95	As above, award mark for both correct processes shown for both accounts, which these figures can be taken as implying the process.
		C1	Ben (shares) supported by 153.78 **and** 173.95	Accept an answer of "shares".
(b)	conclusion	C1	conclusion (ft) eg no change, shares now 182.5… **Acceptable examples** no since shares/Ben now 182.5 Still Ben since 182.5 > Ali No; he only gets 8.57 more No; he gets 68.56 instead of 59.98 (3rd yr) No; Ben already gets more interest, he would just get even more **Not acceptable examples** no shares now 182.5 Still Ben since less than Ali 182.5 > 153.78 no; he needs 20.17 more	Conclusion needs to be supported. ft is from part (a); calculations carried out as part of (b) need to be correct for the comparison to be valid.

(**Q04 1MA1/2H, Nov 2018**)

Q5.

Question	Answer	Mark	Mark scheme	Additional guidance
	12272.70 12272.71 or 12272.72	M1	for evidence of using a correct first step eg 200000×0.015 (= 3000) or 200000×1.015 (= 203000)	
		M1	for evidence of a compound interest method eg 203000×0.015 (= 3045) or 203000×1.015 (= 206045) **or** 206045×0.015 (= 3090.675) or 206045×1.015 (= 209135.675) **or** 209135.675×0.015 (= 3137.035...) or 209135.675×1.015 (212272.710...) **or** 200000×1.015^t, $t \geq 2$	values may be rounded or truncated to 2 dp
		A1	for 12272.7(0) or 12272.71 or 12272.72 SC B2 for 212272.7(0) or 212272.71 or 212272.72	

(**Q25 1MA1/3F, June 2019**)

Q6.

Question	Answer	Mark	Mark scheme	Additional guidance
	12272.70 12272.71 or 12272.72	M1	for evidence of using a correct first step eg 200000 × 0.015 (= 3000) or 200000 × 1.015 (= 203000)	
		M1	for evidence of a compound interest method eg 203000 × 0.015 (= 3045) or 203000 × 1.015 (= 206045) **or** 206045 × 0.015 (= 3090.675) or 206045 × 1.015 (= 209135.675) **or** 209135.675 × 0.015 (= 3137.035...) or 209135.675 × 1.015 (212272.710...) **or** 200000 × 1.015^t, $t \geq 2$	values may be rounded or truncated to 2 dp
		A1	for 12272.7(0) or 12272.71 or 12272.72 SC B2 for 212272.7(0) or 212272.71 or 212272.72	

(**Q02 1MA1/3H, June 2019**)

Q7.

Question	Answer	Mark	Mark scheme	Additional guidance
	344 580.48	P1	for a start to the process to find the initial investment eg 344 605 ÷ 1.025 oe (= 336 200) **or** for 1.025^3 (= 1.07689….)	
		P1	for complete process to find original investment, eg 344 605 ÷ 1.025^3 oe (= 319 078 to 320 265)	
		P1	for [initial investment] × 1.02^2 × 1.035 oe	[initial investment] must be clearly what they believe to be that and cannot be 344605
		A1	for answer in the range 343 587 to 344 581	

(**Q10 1MA1/2H, Nov 2021**)

Q8.

Question	Answer	Mark	Mark scheme	Additional guidance
	7318.15	M1	for a correct first step eg working out increase for one year 7000 × (100 + 3) ÷ 100 (= 7210) oe **or** 7000 × 3 ÷ 100 (= 210) oe **or** find the multiplier for both years eg (100 + 3) ÷ 100 × (100 + 1.5) ÷ 100 (=1.04545)	7315 or 315 implies M1
		M1	for a compound method, eg 7000 × (100 + 3) ÷ 100 × (100 + 1.5) ÷ 100 oe **or** "7210" × 1.5 ÷ 100 or (= 108.15) oe	318.15 implies M1M1A0
		A1	cao	

(**Q06 1MA1/2H, Nov 2022**)

Q9.

Question	Answer	Mark	Mark scheme	Additional guidance
	247.4(0)	M1	for a method to find the value of the investment or interest after 1 year, eg 4500×1.018 (= 4581) **or** 4500×0.018 (= 81)	
		M1	for a method to find the value of the investment after 3 years, eg 4500×1.018^3 (= 4747.4...) **or** "4581" × 1.018 (= 4663.45...) **and** "4663.45..." × 1.018 (= 4747.4... or 4747.39...)	May be seen in more than one calculation Award of this mark implies the first M1 Sight of 83.94... implies M2
		A1	accept 247.39 SCB1 for 243 or 4743 if M0 scored	

(**Q26 1MA1/3F, Nov 2024**)

Q10.

Question	Answer	Mark	Mark scheme	Additional guidance
(a)	4775.38	M1	for a method to find the value after 1 year, eg 4500×1.024 (= 4608) oe	
		M1	for a complete method to find the value after 3 years, eg "4608" × 1.018^2 or "4608" × 1.018 (= 4690.944) **and** "4690.944" × 1.018 oe	Award of this mark implies the first M1 May be seen in more than 1 calculation M2A0 is implied by 275.37 or 275.38 Correct answer not rounded to 2dp gains M2A0
		A1	accept 4775.37 SCB1 for 4770 or 4824 if M0 scored	
(b)	26	P1	for a start to the process, eg 4107 ÷ 7500 (= 0.5476)	0.74 implies P1
		P1	for a process to find percentage change eg $\sqrt[4]{"0.5476"} \times 100$ (= 74) or $\left(\sqrt[4]{"0.5476"} - 1\right) \times 100$ (= −26) **or** $1 - \sqrt{"0.5476"}$ (= 0.26)	
		A1	cao	

(**Q12 1MA1/3H, Nov 2024**)

Q11.

Question	Answer	Mark	Mark scheme	Additional guidance
(a)	580	M1	for method to find value before increase eg 551 ÷ 0.95	
		A1	cao	
(b)	6354.67	M1	for 6000 × 1.024 oe (= 6144)	
		M1	for "6144" × 1.017^2 oe	$6000 \times 1.024 \times 1.017^2$ scores M2
		A1	for 6354.66 **or** 6354.67 **or** 6354.68	If correct answer is stated then subsequently rounded isw and award 3 marks If correct answer stated and then interest only given as the answer award M2A0

(**Q08 1MA1/2H, Nov 2020**)

Q12.

Question	Answer	Mark	Mark scheme	Additional guidance
	4811.20	M1	for full method for one year, eg 4500 × 1.034 (= 4653) oe	Can be implied by 4806 or 9306
		A1	for 4811.2(0)	Accept 4811.202 and 4811.21

(**Q24 1MA1/2F, Nov 2023**)

Q13.

Question	Answer	Mark	Mark scheme	Additional guidance
	4811.20	M1	for full method for one year, eg 4500 × 1.034 (= 4653) oe **OR** for a full method for 2 years, eg 4500×1.034^2 oe	Can be implied by 4806 or 9306
		A1	for 4811.2(0)	Accept 4811.202 and 4811.21

(**Q03 1MA1/2H, Nov 2023**)

Q14.

Question	Answer	Mark	Mark scheme	Additional guidance
(a)	163 or 164	P1	uses formula eg $1.2 \times 200 - 50$ (= 190)	
		P1	for complete process, eg May: $1.2 \times$ "190" – 50 (= 178) **and** June: $1.2 \times$ "178" – 50 (= 163.6)	
		A1	for 163 or 164	
(b)	Statement	C1	(dep P1) ft statement, eg there won't be any rabbits, fewer rabbits, decrease	

(**Q22 1MA1/2H, Nov 2019**)

Q15.

Question	Answer	Mark	Mark scheme	Additional guidance
	7318.15	M1	for a correct first step eg working out increase for one year $7000 \times (100 + 3) \div 100$ (= 7210) oe **or** $7000 \times 3 \div 100$ (= 210) oe **or** find the multiplier for both years eg $(100 + 3) \div 100 \times (100 + 1.5) \div 100$ (=1.04545)	7315 or 315 implies M1
		M1	for a compound method, eg $7000 \times (100 + 3) \div 100 \times (100 + 1.5) \div 100$ oe **or** "7210" $\times 1.5 \div 100$ or (= 108.15) oe	318.15 implies M1M1A0
		A1	cao	

(**Q23 1MA1/2F, Nov 2022**)

Q16.

Question	Answer	Mark	Mark scheme	Additional guidance
	2.2	P1	works out interest for one year, eg 3550×0.026 (= 92.3(0)) **or** 3550×1.026 (=3642.3(0))	
		P1	for compound interest calculation, eg 3550×1.026^2 (= 3736.9…) **or** for an answer given as 0.0219… or 1.0219…	
		A1	answer in range 2.19 to 2.2	If an answer in the range is seen in working and then incorrectly rounded award full marks

(**Q13 1MA1/2H, Nov 2019**)

Q17.

Question	Working	Answer	Mark	Notes
		Secure Bank (supported)	P1	for a process to work out the interest after one year e.g. 0.02×25000 (= 500) or 0.043×25000 (= 1075) or for 1.02 or 25500 or 1.043 or 26075
			P1	for process to find value of the investment after 3 years or the multiplicative factor for 3 years at one of the banks, e.g. $25000 \times 1.02 \times 1.02 \times 1.02$ oe (= 26530...) or 1.02^3 (= 1.0612...) or $25000 \times 1.043 \times 1.009 \times 1.009$ oe (= 26546...) or $1.043 \times 1.009 \times 1.009$ (= 1.0618.....) [accept total interest of 1530...or 1546...if final values of investment are not found]
			C1	for Secure Bank from correct figures eg 26530.. and 26546..or 1530.. and 1546.. or 1.0612.. and 1.0618

(**Q22 1MA1/2F, June 2017**)

Q18.

Question	Working	Answer	Mark	Notes
		Secure Bank (supported)	P1	for a process to work out the interest after one year e.g. 0.02×25000 (=500) or 0.043×25000 (=1075) or for 1.02 or 25500 or 1.043 or 26075
			P1	for process to find value of the investment after 3 years or the multiplicative factor for 3 years at one of the banks, e.g. $25000 \times 1.02 \times 1.02 \times 1.02$ oe (= 26530…) or 1.02^3 (= 1.0612…) or $25000 \times 1.043 \times 1.009 \times 1.009$ oe (= 26546…) or $1.043 \times 1.009 \times 1.009$ (= 1.0618.....) [accept total interest of 1530.. or 1546.. if final values of investment are not found]
			C1	for Secure Bank from correct figures, eg. 26530.. and 26546.. or 1530… and 1546… or 1.0612... and 1.0618…

(**Q06 1MA1/2H, June 2017**)

Q19.

Question	Working	Answer	Mark	Notes
		6 (%)	P1	for y^5 oe or $8029.35 \div 6000$
			P1	for a process to find $1+x$ e.g. $\sqrt[5]{(8029.35 \div 6000)}$ or 1.06 or 1.0599..
			A1	5.99 to 6

(**Q10 1MA1/3H, June 2017**)

Q20.

Question	Working	Answer	Mark	Notes
9 (a)		5	M1	evaluates $(0.85)^n$ or $12\,500 \times (0.85)^n$ for at least one value of n
			A1	cao
(b)		2.4	P1	for a process to find the amount of interest before tax, eg $79.20 \div 0.6$ (= 132)
			P1	for a process to find value of R, eg "132"÷5500×100
			A1	cao

(**Q09 1MA1/3H, Nov 2017**)

Q21.

Question	Working	Answer	Mark	Notes
(a)		58600	M1	for a complete method, eg 50000×1.02^8 (= 58582(.969...))
				or for finding the increase in value of the company after 8 years,
				eg 8582(.969...) or 8600
			A1	cao
(b)		4.5	P1	for a process to find multiplier for 6 year period, eg $325 \div 250$ oe (= 1.3) or 130(%)
				or for $250000 \times y^6 = 325000$
			P1	for a process to find multiplier for one year, eg $("1.3")^{\frac{1}{6}}$ or 1.044…or 1.045
			A1	4.4 – 4.5

(**Q13 1MA1/2H, Nov 2017**)