

REVISE

.wales

1.06 – Simple & Compound Interest

Mark schemes for the 1.06 question pack

Spec 1.8.3, 1.8.4 – Unit 1

SOLUTIONS · 2025 SPECIFICATION

Mark schemes for the 15 questions in the corresponding revise.wales question pack (69 marks total). Sources: legacy WJEC GCSE papers, WJEC SAM, and custom-authored mark schemes. Pack layout © revise.wales.

2. $34 \times 0.98^2 \times 1.06^5$	M2	OR equivalent method to decrease by 2% and to increase by 6% on different amounts ($34 \times 0.98^2 = 32.6536$) ($34 \times 1.06^5 = 45.4996\dots$) M1 for sight of either $\times 0.98^2$ or $\times 1.06^5$ or equivalent calculations
Answer in the range (£)43.67 to (£)43.7(0)	A1	CAO, from correct working

MATHS 2016		
10(a)(i) 0.0198	B1	
10a(ii) Banc Padarn For use of $n = 12$ $(AER =) (1 + 0.0198/12)^{12} - 1$ $= 0.01998(0\dots)$ OR $1.998(0\dots)\%$ Banc Padarn's savings account would give most interest per annum.	B1 M1 A1 E1	FT 'their 0.0198' for M1 only Allow $0.02(00\dots)$ OR $2(00)\%$ Do not accept 0.01998% or $0.02(00\dots)\%$ FT 'their AER for Banc Padarn' provided at least M1 awarded AND they are comparing like percentages or decimals <i>Alternative method:</i> B1 for monthly interest rate of 0.00165 M1 for the method of calculating the value of an investment for Banc Padarn after a year ($initial\ investment \times 1.00165^{12}$) and Banc Teilo ($initial\ investment \times 1.0199$) A1 for accurate values for both banks (with appropriate rounding) E1 for Banc Padarn chosen
10(b)(i) 0.00165	B1	
10(b)(ii) (31 st May OR 1 st June) (Interest =) $(0.00165 \times 150\ 000)$ (£)247.5(0) (30 th June OR 1 st July) (Interest =) $(0.00165 \times 150\ 247.5(0))$ (£)247.90(84) OR Total interest of (£)495.40(84) (31 st July OR 1 st August) (Interest =) $(0.00165 \times 150\ 495.40(84))$ (£)248.31(74) OR Total interest of (£)743.72(58) (Tax to pay =) ('their 743.72(58)' – 500) $\times 0.4$ 31 st July OR 1 st August AND (£)97.49(032)	B1 B1 B1 M1 A1	FT 'their 247.5(0)' FT 'their 247.90(84)' <i>Alternative method:</i> B1 for $(1.00165 \times 150\ 000)$ (£)150247.5(0) B1 for $(1.00165^2 \times 150\ 000)$ (£)150495.40(84) This B1 implies the 1 st B1 B1 for $(1.00165^3 \times 150\ 000)$ (£)150743.72(58) The last B1 implies the previous two B1 marks FT 'their 743.72(58)' provided compound interest attempted Allow 'End of July' OR '30 th July' for the date Allow (£)97.48 from rounding down of the monthly interest payments

1. $850 \times 0.76 (= \text{£}646)$ or equivalent $\times 0.87^6$ or equivalent $(\text{£})280(.1225\dots)$	M1 M1 A1	M1 marks can be awarded in either order (Note: If calculated first $850 \times 0.87^6 = \text{£}368.58(22\dots)$) Accept answers in the inclusive range $(\text{£})280$ to $(\text{£})281$ Award M1, SC1 for an answer $(850 \times 0.76 \times 0.87^7 = \text{£})$ in the inclusive range $(\text{£})243$ to $(\text{£})244$
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<p>10. Appropriate use of 12 and 2 in the AER formula Sight of 0·0385 and 0·0386 (AER Bannau =) $(1+0·0385/12)^{12} - 1$ OR (AER Eryri =) $(1+0·0386/2)^2 - 1$</p> <p>(AER Bannau =) 0·0391(866...) or 0·0392 OR 3·91(866...) % or 3·92 % AND (AER Eryri =) 0·0389(724...) or 0·0390 OR 3·89(724...) % or 3·9(0) % AND Correct statement e.g. 'Bannau offers better annual rate of interest'</p>	<p>B1 B1 M1 A2</p>	<p>Denominators AND powers Or 3·85/100 and 3·86/100</p> <p>Do not accept 0·0391(866...) % or 0·0392 % Do not accept 0·0389(724...) % or 0·0390 % A1 for either correct AER</p> <p>If no marks awarded, SC2 for comparing correct end of year amounts (amount × 1·0392, amount × 1·0390) with a correct conclusion SC1 for calculating the correct end of year amount for one account</p>
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5. 7500×1.0031^n $7500 \times 1.0031^{21} = (£) 8003.68(7105)$ 21 (months)	B1 M1 A1	For any value of n ($7500 \times 1.0031 = (£)7523.25$) May be implied Allow 7500×1.0031^{20} (= $(£)7978.95(2352)$) with convincing work that (£) 8000 will be reached the following month. Answer clearly seen, not embedded in their method.
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<p>7(a) $\frac{14}{2800} (\times 100) \times 12$ OR $\frac{14.07}{2814} (\times 100) \times 12$</p> <p>= 6(%) or 0.06</p>	<p>M2</p> <p>A1</p>	<p>M1 for $\frac{14}{2800} (\times 100)$ OR $\frac{14.07}{2814} (\times 100)$ Or M1 for 0.005 or 0.5%</p> <p>A0 for 0.06%</p>
<p>7(b) $(1 + \frac{0.06}{12})^{12} - 1$ or equivalent</p> <p>= 6.17 (%)</p>	<p>M1</p> <p>A2</p>	<p>FT their final answer from (a)</p> <p>A1 for 0.061(67...) or 0.062, OR A1 for 6.1(67...%) or 6.2(%)</p> <p><i>Alternative methods:</i> M1 for 2800×1.005^{12} M1 for $\frac{2972.69(7873) - 2800}{2800} (\times 100)$ or equivalent FT 'their 2972.69(7873) provided previous M1 awarded. A1 for 6.17 (%), OR</p> <p>M1 for $(1 + \frac{0.06015}{6})^6 - 1$ A2 for 6.17 (%) A1 for 0.06(167...), or for a correct percentage but not correct to 2 dp.</p>

<p>4(a) $0.02 \times 3000 + 3000$ (= £3060)</p> <p>$0.02 \times 3060 + 3060$</p> <p>(£)3121.2(0)</p>	<p>M1</p> <p>M1</p> <p>A1</p>	<p>Allow for sight of 3060 (irrespective of labelling) or for sight of 3120 (simple interest)</p> <p>FT 'their 3060', mark is for the method (= £61.2(0) + £3060)</p> <p>CAO</p> <p><i>Alternative:</i></p> <p><i>Sight of $1.02^2 \times 3000$</i> M1</p> <p><i>1.0404×3000</i> M1</p> <p><i>FT 'their 1.0404' incorrectly evaluated</i></p> <p><i>(£)3121.2(0)</i> A1 CAO</p> <p>If no marks, award SC1 for (£)2881.2(0) (from depreciation)</p>
<p>4(b) $72 \div 0.8$ or $100 \times 72 \div 80$</p> <p>(£) 90</p>	<p>M1</p> <p>A1</p>	<p>Accept an unsupported answer of (£)90</p> <p>Allow M1, A1 for a (£)90 found from trial & improvement</p>

<p>8(a) Use of 2 as a denominator and power in the AER formula</p> $(AER =) (1 + 0.04/2)^2 - 1$ <p>Method to calculate 1.02^2</p> $= 0.0404$ $= 4.04 \%$	<p>B1</p> <p>M1 m1</p> <p>A1 A1</p>	<p>For a correct method seen, not for accuracy $1.02 \times 1.02 = 1.04$ is not sufficient to award this m1 mark</p> <p>FT from B1M1m1A0 provided their percentage is greater than 4%</p>
<p><u>Alternative method:</u> <i>Intention to increase a sum of money by 2%</i> <i>Correct method to increase a sum of money by 2% twice</i></p> $\frac{\text{increase} (\times 100 \%)}{\text{original}}$ $= 0.0404$ $= 4.04 \%$	<p>B1</p> <p>M1</p> <p>M1</p> <p>A1 A1</p>	<p>(e.g. (£)1020)</p> <p>(e.g. (£)1040.40)</p> <p>If a candidate uses <u>new amount</u> ($\times 100\%$) <i>original</i> do not award M1 unless they then show the intention to subtract 1 (or 100%)</p> <p>FT from B1M1m1A0 provided their percentage is greater than 4%</p>
<p>8(b) Explanation e.g. 'So that customers can compare accounts', or 'So that customers (or banks) can compare interest rates accurately', or 'Customers (or banks) can easily work out how much they will have after a year', or 'To calculate (or show) how much interest they offer per year'</p>	<p>E1</p>	<p>Allow e.g. 'It's a higher rate than the nominal annual rate (to make it more attractive)'</p>
<p>8(c) 3000×1.0404 OR $3000 \times 1.02 \times 1.02$</p> $= (\pounds) 3121.2(0)$ $(\pounds) 78.8(0)$	<p>M2</p> <p>A1 B1</p>	<p>FT their AER from part (a) provided of equivalent difficulty M1 for 3000×1.02 or equivalent</p> <p>FT from M2 FT provided M2 awarded AND 'their (£) 3121.2(0)' is $<$ (£) 3200</p> <p>If no marks awarded, and an integer AER derived in (a), then SC1 for $3000 \times$ 'their 1.0404' SC2 for the correct evaluated difference between 3200 and $3000 \times$ 'their 1.0404'</p>

<p>3(a) (Number of units is) 800</p> <p>(Electricity cost is) 800×0.23 or 800×23 (£)184 or 18400(p)</p> <p>(Standing charge + electricity) (£) 208 or 20800(p)</p> <p>(Total bill including VAT at 5%) 1.05×208 or 1.05×20800 or equivalent (£)218.4(0) or 21840(p)</p> <p>(Budget per month $\text{£}218.40 \div 3 =$) (£)72.8(0) or 7280(p)</p>	<p>B1</p> <p>M1</p> <p>A1</p> <p>B1</p> <p>M1</p> <p>A1</p> <p>B1</p>	<p>FT 'their 20950 – 20150', must be from attempting this subtraction</p> <p>If units are given they must be correct Accept £184.00p, do not accept £184p</p> <p>FT 24 + 'their 184' provided units are consistent May be in implied or embedded in further work, e.g. if $184 \times 1.05 + 24$ seen and calculated correctly to (£)217.2(0)</p> <p>FT 'their (£)208' or 'their 20800(p)', including if the standing charge is omitted (i.e. (£)184 used) Allow if standing charge is added after adding VAT to the electricity cost</p> <p>CAO</p> <p>FT 'their total bill' $\div 3$ provided at least 2 marks previously awarded Allow rounded up to the nearest £ On FT allow rounding to 10p, or rounding up to the nearest £</p> <p>(Note: FT answers from</p> <ul style="list-style-type: none"> one month standing charge $(\text{£})201.6(0) \div 3 = (\text{£})67.2(0)$ standing charge omitted $(\text{£})193.2(0) \div 3 = (\text{£})64.4(0)$
<p>3(a) <i>Alternative method:</i></p> <p>(Number of units is) 800</p> <p>(Electricity cost is) 800×0.23 or 800×23 (£)184 or 18400(p)</p> <p>(Budget before VAT $184 \div 3 + 24 \div 3 =$) (£) 69.33(3..)</p> <p>(Total bill including VAT at 5%) $1.05 \times (184 \div 3 + 24 \div 3)$ or equivalent</p> <p>(Budget per month) (£)72.8(0) or 7280(p)</p>	<p>B1</p> <p>M1</p> <p>A1</p> <p>B1</p> <p>M2</p> <p>A1</p>	<p><i>Watch for stages in other orders, check for embedded equivalent stages</i></p> <p>FT 'their 20950 – 20150', must be from attempting this subtraction</p> <p>If units are given they must be correct Accept £184.00p, do not accept £184p</p> <p>FT 'their 184' + 8 provided units are consistent May be implied or embedded in further work, e.g. if $(184 \div 3) \times 1.05 + 8$ seen and calculated correctly to (£)72.4(0)</p> <p>FT 'their $184 \div 3 + 24 \div 3$' M1 for either of the following:</p> <ul style="list-style-type: none"> $1.05 \times$ 'their $184 \div 3$' (no standing charge included) $1.05 \times$ 'their $184 \div 3 + 8$' (no VAT on standing charge) <p>FT from M2 or M1 Allow rounded up to the nearest £ On FT allow rounding to 10p, or rounding up to the nearest £</p>

<p>Organisation and communication</p> <p>Writing</p>	<p>OC1</p> <p>W1</p>	<p>For OC1, candidates will be expected to:</p> <ul style="list-style-type: none"> • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanations and working in a way that is clear and logical • write a conclusion that draws together their results and explains what their answer means <p>For W1, candidates will be expected to:</p> <ul style="list-style-type: none"> • show all their working • make few, if any, errors in spelling, punctuation and grammar • use correct mathematical form in their working • use appropriate terminology, units, etc.
<p>3(b) $500 \times 1.022^5 \times 1.016^{15}$ $(500 \times 1.022^5 = 557.473\dots)$ $(500 \times 1.016^{15} = 634.418\dots \text{ or } 634.42)$</p> <p>(£) 707.34</p>	<p>M3</p> <p>M2</p> <p>OR</p> <p>M1</p> <p>A1</p>	<p>OR equivalent method to increase by 2.2% and to increase by 1.6% on different amounts for appropriate number of years</p> <p>M2 for sight of either $\times 1.022^5$ or $\times 1.016^{15}$ or equivalent calculations</p> <p>OR</p> <p>M1 for sight of either $\times 1.022$ or $\times 1.016$ or equivalent calculations</p> <p>A1 Mark final answer, CAO, accepting answers in the range (£) 707.33 to (£) 707.35</p> <p>(Note: Sight of (£)511 or (£)555 implies 500×1.022, from working with 2.2% of £500, M1 is awarded)</p>

<p>6. Morgannwg bank</p> $1.0041^{12} - 1 \quad \text{OR} \quad \left(1 + \frac{0.0492}{12}\right)^{12} - 1$ $= 0.0503(\dots) \text{ or } 5.03(\dots)\%$ <p>Banc Gwynedd</p> $\left(1 + \frac{0.0492}{4}\right)^4 - 1$ $= 0.0501(\dots) \text{ or } 5.01(\dots)\%$ <p>(Answer =) 0.02%</p>	<p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p> <p>B1</p>	<p>Do not accept 0.0503(...) % unless corrected in further work</p> <p>Do not accept 0.0501(...) % unless corrected in further work</p> <p>FT 'their 0.0503(...) or 5.03(...)%' AND FT 'their 0.0501(...) or 5.01(...)%' provided at least one M1 mark awarded and final answer written correct to 2 d.p</p>
<p><i>Alternative method:</i></p> $\text{Amount} \times 1.0041^{12} - \text{amount} \times \left(1 + \frac{0.0492}{4}\right)^4$ <p>= correct difference</p> $\frac{\text{difference}}{\text{amount}} (\times 100)$ $= 0.02\%$	<p>M2</p> <p>A1</p> <p>M1</p> <p>A1</p>	<p>M1 for a subtraction with 1 correct product</p> <p>From M2 only</p> <p>FT 'their values' provided at least M1 previously awarded</p> <p>Needs to be correct to 2 d.p. on FT</p>

<p>3(a) $4500 \times (1 - 0.2(0)) \times (1 - 0.14)^9$ or $4500 \times 0.8(0) \times 0.86^9$ or equivalent</p> <p>An answer in the range (£)926.35 to (£)926.40</p>	<p>M2</p> <p>A1</p>	<p>For M2, do not ignore any additional years considered, unless 10 years selected or implied in later working</p> <p>M1 for equivalent of one of the following (which may be embedded in other working):</p> <ul style="list-style-type: none"> • $4500 \times (1 - 0.2(0))$ (= 3600) • $4500 \times 0.8(0)$ (= 3600) • $4500 \times (1 - 0.14)^9$ (= 1157.97...) • 4500×0.86^9 (= 1157.97...) <p>An answer for 10 years (not beyond) must be selected</p> <p>Allow an answer of (£)926 provided not from rounding an amount outside the range given</p> <p>Award M1, SC1 for an answer ($4500 \times 0.8 \times 0.86^{10} =$) (£)796.68(5....) or (£)796.69 or (£)796.70 or (£)797</p>
<p>3(b) $100 \times 750 \div 125$ or $100 \times \frac{750}{125}$ or equivalent</p> <p>(£) 600</p>	<p>M1</p> <p>A1</p>	<p>Answer space takes precedence</p>
<p>3(c)</p> <p>Sight of appropriate 80 (cm) (height of triangle)</p> <p>($\frac{1}{2}$ width =) $\frac{80}{\tan 33^\circ}$ or ($\frac{1}{2}$ width =) $80 \times \tan (90^\circ - 33^\circ)$</p> <p style="text-align: center;">× 2</p> <p>(Width of garage is) 246(cm) to 246.4(cm)</p>	<p>B1</p> <p>M2</p> <p>m1</p> <p>A1</p>	<p>Accept equivalents using the sine rule throughout '$\frac{1}{2}$ width' may be referred to by any unknown</p> <p>Check if indicated on the diagram</p> <p>(= 123.189... cm or 123.2 cm) FT 'their 80' provided ≤ 120 and $\neq 90$</p> <p>M1 for sight of $\tan 33^\circ = \frac{80}{\frac{1}{2} \text{ width}}$ or $\tan (90^\circ - 33^\circ) = \frac{\frac{1}{2} \text{ width}}{80}$</p> <p>FT provided at least M1 previously awarded, i.e. for intention to double 'their $\frac{1}{2}$ width'</p> <p>CAO. ISW</p>
<p>3(d)</p> <p>(Maximum space =) $555 - 395 - 70$ or $550 - 400 + 2 \times 5 - 70$ or equivalent</p> <p style="text-align: center;">90 (cm)</p>	<p>M2</p> <p>A1</p>	<p>Check the diagram</p> <p>M1 for any of the following</p> <ul style="list-style-type: none"> • use of $550 < \text{'their 555'} \leq 560$ AND $390 \leq \text{'their 395'} < 400$ • for sight of 555 and 395 • for sight of $550 - 400 + 2 \times 5$ <p>CAO</p> <p>Award M1 and SC1 for an answer of $(555 - 395 =)$ 160 (cm)</p>

<p>6(a)</p> $335 \left(\frac{\left(\left(1 + \frac{5.4/100}{12} \right)^n - 1 \right) \left(1 + \frac{5.4/100}{12} \right)}{\frac{5.4/100}{12}} \right) \text{ or}$ $335 \left(\frac{\left((1 + 0.0045)^n - 1 \right) (1 + 0.0045)}{0.0045} \right)$ $335 \left(\frac{\left(\left(1 + \frac{5.4/100}{12} \right)^{28} - 1 \right) \left(1 + \frac{5.4/100}{12} \right)}{\frac{5.4}{12 \times 100}} \right) \text{ or}$ $335 \left(\frac{\left((1 + 0.0045)^{28} - 1 \right) (1 + 0.0045)}{0.0045} \right)$ <p>= (£) 10017(.57...) or (£) 10018</p> <p>(Date when Rebecca has £10000) November 2024</p>	<p>B1 For any value of n</p> <p>M1 OR $335 \left(\frac{\left(\left(1 + \frac{5.4/100}{12} \right)^n - 1 \right) \left(1 + \frac{5.4/100}{12} \right)}{\frac{5.4/100}{12}} \right) = 10000$ (or ≥ 10000)</p> <p>A1 Or evidence that n = 28 An answer of 28 months with no incorrect work seen can be awarded B1M1A1 and possible final A1</p> <p>A1 CAO If first B1 only awarded, SC1 for a correct evaluation of the formula for any value of n from 20 to 30</p> <ul style="list-style-type: none"> • n=20 leads to (£)7025(.78...) or (£)7026 • n=21 leads to (£)7393(.906...) or (£)7394 • n=22 leads to (£)7763(.686...) or (£)7764 • n=23 leads to (£)8135(.13...) • n=24 leads to (£)8508(.246...) • n=25 leads to (£)8883(.04...) • n=26 leads to (£)9259(.52...) or (£)9260 • n=27 leads to (£)9637(.697...) or (£)9638 • n=29 leads to (£)10399(.16...) • n=30 leads to (£)10782(.46...) <p>If no marks awarded and from using a rate of ${}^{5.4}f_{12} = 0.45$, SC2 for (£)13467(.65...) or (£)13468 AND Feb 2023 from</p> $335 \left(\frac{\left((1 + 0.45)^7 - 1 \right) (1 + 0.45)}{0.45} \right), \text{ or}$ <p>SC1 for (£)13467(.65) or (£)13468</p> <p>If no marks awarded and from using a rate of 0.045, SC2 for (£)10174(.426...) AND February 2024 from</p> $335 \left(\frac{\left((1 + 0.045)^{19} - 1 \right) (1 + 0.045)}{0.045} \right), \text{ or}$ <p>SC1 for (£)10174(.426...)</p> <p>If no marks awarded and from using a rate of 0.054, SC2 for (£)10312(.178...) AND January 2024 from</p> $335 \left(\frac{\left((1 + 0.054)^{18} - 1 \right) (1 + 0.054)}{0.054} \right), \text{ or}$ <p>SC1 for (£)10312(.178...)</p>
<p>6(b) (AER =) $\left(1 + \frac{5.4/100}{12} \right)^{12} - 1$ or equivalent = 5.54(%)</p>	<p>M1 A1 Sight of an answer of 5.53(5675...%) is awarded M1A0</p>

| 6(c) £ 236.84

| B1 |

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<p>5. $2500 \times (1 - 0.23) \times (1 - 0.04)^{39} \times (1 + 0.14)^{10}$ or $2500 \times 0.77 \times 0.96^{39} \times 1.14^{10}$ or equivalent</p> <p style="text-align: right;">(£) 1452(.30)</p>	<p>M3</p> <p>A1</p>	<p>May be seen in stages</p> <p>M2 for a product with any 3 correct terms OR M1 for a product with any 2 correct terms</p> <p>CAO, ignore premature rounding in working provided answer is (£) 1452.(...), allow rounded to (£)1450 from correct working</p> <div style="border: 1px solid black; padding: 5px;"> <p>Note:</p> <p>$2500 \times 0.77 = (\text{£}) 1925$</p> <p>$2500 \times 0.96^{39} = (\text{£}) 508.766\dots$</p> <p>$2500 \times 1.14^{10} = (\text{£}) 9268.053\dots$</p> <p>$0.77 \times 0.96^{39} = 0.15669\dots$</p> <p>$0.77 \times 1.14^{10} = 2.854\dots$</p> <p>$0.96^{39} \times 1.14^{10} = 0.7544\dots$</p> <p>$2500 \times 0.77 \times 0.96^{39} = (\text{£}) 391.7498\dots$</p> <p>$2500 \times 0.77 \times 1.14^{10} = (\text{£}) 7136.401\dots$</p> <p>$2500 \times 0.96^{39} \times 1.14^{10} = (\text{£})1886.108\dots$</p> <p>$0.77 \times 0.96^{39} \times 1.14^{10} = 0.5809\dots$</p> <p>Values may differ by rounding at individual stages</p> </div>
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<p>5(a) $0.03 \times 4000 + 4000$ or 1.03×4000 (= £4120) or equivalent</p> <p>$0.03 \times 4120 + 4120$ or 1.03×4120 or equivalent</p> <p>(£)4243.6(0)</p>	<p>M1</p> <p>M1</p> <p>A1</p>	<p>Allow for sight of one of the following:</p> <ul style="list-style-type: none"> • 4120 (irrespective of labelling) • 4240 (simple interest) <p>FT 'their 4120' (the mark is for the method) (= £123.6(0) + £4120)</p> <p>CAO. Answer space takes precedence if completed, otherwise mark final answer for the amount</p> <p>If no marks, award SC1 for (£)3763.6(0) (from depreciation)</p>
<p>5(a) <u>Alternative method</u></p> <p>Sight of $1.03^2 \times 4000$ 1.0609×4000 (£)4243.6(0)</p>	<p>M1</p> <p>A1</p> <p>A1</p>	<p>CAO. Answer space takes precedence if completed, otherwise mark final answer for the amount</p> <p>If no marks, award SC1 for (£)3763.6(0) (from depreciation)</p>
<p>5(b)(i) $100 \times 42 \div (100 + 40)$ or $42 \div 1.4$ or equivalent</p> <p>(£) 30</p>	<p>M1</p> <p>A1</p>	<p>CAO. Answer space takes precedence</p> <p>Accept a correct answer from trial and improvement</p>
<p>5(b)(ii) (Volume of gold = mass \div density =)</p> <p>$6 \times 10^{-3} \times 1000 \div 20$ or $6 \div 20$ or $6 \times 10^{-3} \div (20 \div 1000)$ or $6 \times 10^{-3} \div 0.02$ or equivalent</p> <p>$0.3 \text{ (cm}^3\text{)}$ or $\frac{3}{10} \text{ (cm}^3\text{)}$</p>	<p>M2</p> <p>A1</p>	<p>Must be dimensionally correct</p> <p>M1 for any one of the following:</p> <ul style="list-style-type: none"> • sight of $6 \times 10^{-3} \times 1000$ (= 6 g) • sight of $20 \div 1000$ (= 0.02 kg/cm³) • method with incorrect place value, 'their mass' \div 'their density' provided that <ul style="list-style-type: none"> • the only non-zero digit in 'their mass' = 6 • <u>and</u> • the only non-zero digit in 'their density' = 2 <p>e.g. $6 \times 10^{-3} \div 20$, $6 \times 10^{-3} \div 0.2$, $600 \div 20$, $6000 \div 20$</p> <p>CAO, allowing $3 \times 10^{-1} \text{ (cm}^3\text{)}$</p>

<p>7(a) (AER =) $(1 + 0.0026)^{12} - 1$ or equivalent = 3.16(500...) or 3.17 or 3.2 (%)</p>	<p>M1 A1</p>	<p>e.g. $\left(1 + \frac{12 \times 0.0026}{12}\right)^{12} - 1$ or $\left(1 + \frac{0.0312}{12}\right)^{12} - 1$</p>
<p>7(b) $AER = \left(1 + \frac{2.48 \div 100}{4}\right)^4 - 1 =$ = 0.025(03...) or 2.5(03...) (%)</p> <p>(Amount in account after 10 years =) $3000 \times (1 + 0.025(03...))^{10}$ = (£)3841.43(752...) or (£)3841.44</p> <p>(Percentage increase =) $\frac{3841.43(752...) - 3000}{3000} (\times 100)$ or $\frac{3841.43(752...) - 1}{3000} (\times 100)$ = 28(.04) to 28.05 (%)</p>	<p>M1 M1 A1 M1 A1</p>	<p>The -1 may be implied in further working</p> <p>FT 'their derived 0.025(03...)' provided it comes from the AER formula with $1 < n \leq 12$</p> <p>CAO. Must come from M1M1 Accept (£)3840.25 from the use of the multiplier 1.025 provided M1M1 previously awarded</p> <p>FT 'their 3841.43(752...)' provided at least one M1 previously awarded</p> <p>An amount in the account after 10 years of (£)3840.25 leads to 28(.008) (%)</p> <p>If no marks awarded, SC1 for an answer of 27.7(58...) or 27.8% from use of $\frac{3000 \times (1.0248)^{10} - 3000}{3000} \times 100$ or $((1.0248)^{10} - 1) \times 100$ or equivalent</p>
<p>7(b) <u>Alternative method 1:</u> (Quarterly rate =) $\frac{2.48}{4}$ (%) or $\frac{2.48 \div 100}{4}$ = 0.62(%) or 0.0062</p> <p>(Amount in account after 10 years =) $3000 \times \left(1 + \frac{2.48 \div 100}{4}\right)^{10 \times 4}$ or 3000×1.0062^{40} = (£)3841.43(752...) or (£)3841.44</p> <p>(Percentage increase =) $\frac{3841.43(752...) - 3000}{3000} (\times 100)$ or $\frac{3841.43(752...) - 1}{3000} (\times 100)$ = 28(.04) to 28.05 (%)</p>	<p>M1 M1 A1 M1 A1</p>	<p>May be implied in further working</p> <p>FT 'their 0.0062' provided it comes from 2.48(+100) /n provided $1 < n \leq 12$ Allow $3000 \times \left(1 + \frac{2.48 \div 100}{n}\right)^{10 \times n}$ provided their value of n has been used consistently and $1 < n \leq 12$</p> <p>CAO. Must come from M1M1</p> <p>FT 'their 3841.43(752...)' provided at least one M1 previously awarded</p>

<p>7(b) <u>Alternative method 2:</u></p> $AER = \left(1 + \frac{2.48 \div 100}{4}\right)^4 - 1 =$ <p style="text-align: center;">(= 0.025(03...) or 2.5(03...) (%))</p> <p>(Percentage increase =) $(1 + 0.025(03...))^{10} - 1$</p> <p style="text-align: right;">= 28(.04) to 28.05 (%)</p>	<p>M1</p> <p>M3</p> <p>A1</p>	<p>The -1 may be implied in further working</p> <p>FT 'their 0.025(03...)' provided it comes from $\left(1 + \frac{2.48+100}{n}\right)^n - 1$ where n has been used consistently and $1 < n \leq 12$ M2 for $(1 + 0.025(03...))^{10}$</p> <p>CAO. Must come from M1M3</p>
<p>7(b) <u>Alternative method 3:</u></p> <p>(Quarterly rate =) $\frac{2.48}{4}$ (%) or $\frac{2.48+100}{4}$</p> <p style="text-align: center;">(= 0.62(%) or 0.0062)</p> <p>(Percentage increase =) $(1 + 0.0062)^{10 \times 4} - 1$</p> <p style="text-align: right;">= 28(.04) to 28.05 (%)</p>	<p>M1</p> <p>M3</p> <p>A1</p>	<p>FT 'their 0.0062' provided it comes from $2.48(+100) / n$ provided $1 < n \leq 12$ Allow $\left(1 + \frac{2.48+100}{n}\right)^{10 \times n} - 1$ provided their value of n has been used consistently and $1 < n \leq 12$ M2 for $(1 + 0.0062)^{10 \times 4}$</p> <p>CAO</p>