



4.1F Compound Interest and Depreciation: Foundation Tier Practice

EDEXCEL Edexcel 1MA1 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** Work out 10% of £120, then add it to 120 to find the amount after a 10% increase.

(Total for Question 1 is 1 mark)

- 2** A savings account pays 5% compound interest per year. Work out the value of £150 after 2 years.

(Total for Question 2 is 2 marks)

- 3** A smartphone cost £240 new. Its value falls by 20% each year. Work out its value after 3 years. Give your answer to 2 decimal places.

(Total for Question 3 is 2 marks)

- 4** A jacket now costs £198 after a 10% increase in price. Work out the original price of the jacket before the increase.

(Total for Question 4 is 2 marks)

- 5** A pair of trainers cost £400. After 2 years with compound interest they are worth £484. Work out the annual percentage increase.

(Total for Question 5 is 2 marks)

- 6** Jamie invests £800 at 6% compound interest per year.
Part (a) Work out the value after 3 years. Part (b) Work out the interest Jamie has earned after 3 years, to the nearest pound.

(a) Work out the value after 3 years. (3)

(b) Work out the interest earned after 3 years, to the nearest pound. (2)

(Total for Question 6 is 5 marks)

- 7** A used car is priced at £6000. It depreciates by 12% each year for 2 years. After that it is sold and the sale price is reduced by a further 5% as a one-off discount. Work out the final sale price to the nearest pound.

(Total for Question 7 is 3 marks)

- 8** A tablet is now priced at £96 after losing 20% of its value each year for 2 years. Work out the original price of the tablet.

(Total for Question 8 is 2 marks)

- 9** Sarah invests £500 at 4% compound interest. Find how many years it takes for her investment to reach £608. Give your answer to the nearest whole year. Use your calculator and show the method.

(Total for Question 9 is 3 marks)

- 10** Start with £250. It is increased by 8% and then decreased by 8%. Work out the final amount to 2 decimal places.

(Total for Question 10 is 2 marks)

- 11** Find the compound multiplier for 3% compound interest over 4 years (that is, the number you multiply the original amount by). Give your answer to 4 decimal places.

(Total for Question 11 is 1 mark)

- 12** Show that a 10% compound increase for 3 years gives an overall increase of approximately 33.1%. You do not need to show every multiplication; give the multiplier and the percentage increase to 1 decimal place.

(Total for Question 12 is 2 marks)

Mark scheme · 4.1F Compound Interest and Depreciation: Foundation Tier Practice

Question 1

- **B1** £132 cao
- **Answer:**132.00 (or £132) (132 cao). **Note:** 10% of 120 is 12; $120 + 12 = 132$.

Working check: $120 + (10\% \text{ of } 120 = 12) = 132$.

Question 2

- **M1** method: $150 \times (1.05)^2$ or $150 \times 1.05 \times 1.05$
- **A1** £165.38 cao (to 2 dp) or £165.375 oe
- **Answer:**£165.38 (to 2 dp)

Working check: $150 \times (1.05)^2 = 150 \times 1.1025 = 165.375 \rightarrow \text{£165.38 (rounded to 2 dp)}$.

Question 3

- **M1** method: $240 \times (0.8)^3$ or $240 \times 0.8 \times 0.8 \times 0.8$
- **A1** £122.88 cao (to 2 dp)
- **Answer:**£122.88

Working check: $240 \times 0.8^3 = 240 \times 0.512 = 122.88$.

Question 4

- **M1** method: divide by 1.10
- **A1** £180 cao
- **Answer:**£180

Working check: **Original** = $198 / 1.10 = 180$. **Check:** $180 \times 1.10 = 198$.

Question 5

- **M1** method: find factor $484/400 = 1.21$, then find annual factor $\sqrt{1.21}$ or $1.21^{1/2}$
- **A1** 10% cao
- **Answer:**10%

Working check: **overall factor** = $484/400 = 1.21$. **Annual factor** = $\sqrt{1.21} = 1.1$ so **rate** = 10%.

Question 6

- (a) **M1** method: $800 \times (1.06)^3$
- (a) **M1** calculate $(1.06)^3$ or multiply $800 \times 1.06 \times 1.06 \times 1.06$
- (a) **A1** £952.81 cao (to 2 dp)
- (a) **Answer:** £952.81
- (b) **M1** method: interest = value after 3 years - original amount
- (b) **A1** £153 cao (nearest pound)
- (b) **Answer:**£153 (nearest pound)

Working check: **interest** = $952.8128 - 800 = 152.8128 \rightarrow \text{£153 (nearest pound)}$.

Question 7

- **M1** method: $6000 \times (0.88)^2$ then $\times 0.95$
- **M1** correct intermediate calculation $6000 \times 0.88^2 = 6000 \times 0.7744 = 4646.4$
- **A1** £4413 cao (to nearest pound $4646.4 \times 0.95 = 4413.08 \rightarrow 4413$)
- **Answer: £4413 (nearest pound)**

Working check: after 2 years = $6000 \times 0.88^2 = 4646.40$; after 5% discount = $4646.40 \times 0.95 = 4413.08 \rightarrow \text{£}4413$.

Question 8

- **M1** method: divide by 0.8^2 or 0.64
- **A1** £150 cao
- **Answer: £150**

Working check: original = $96 / 0.64 = 150$.

Question 9

- **M1** method: set up $(1.04)^n = 608/500 = 1.216$
- **M1** use logs or calculator to find n: $n = \ln(1.216)/\ln(1.04)$ or equivalent
- **A1** 5 years cao (rounded to nearest whole year)
- **Answer: 5 years (to nearest whole year)**

Working check: $608/500 = 1.216$. $n = \ln(1.216)/\ln(1.04) = 4.99 \rightarrow 5$ years (nearest whole year).

Question 10

- **M1** method: $250 \times 1.08 \times 0.92$
- **A1** £248.40 cao (to 2 dp)
- **Answer: £248.40**

Working check: $250 \times 1.08 = 270.00$; $270.00 \times 0.92 = 248.40$.

Question 11

- **B1** 1.1255 cao ($1.03^4 = 1.12550881 \rightarrow 1.1255$ to 4 dp)
- **Answer: 1.1255 (to 4 dp)**

Working check: $(1.03)^4 = 1.12550881 \rightarrow 1.1255$ (4 dp).

Question 12

- **M1** state multiplier $(1.1)^3 = 1.331$
- **A1** state increase 33.1% awrt or 33.1% cao
- **Answer: Multiplier = 1.331, overall increase = 33.1%**

Working check: $(1.1)^3 = 1.331 \rightarrow \text{increase} = 1.331 - 1 = 0.331 = 33.1\%$.