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Free-Standing Mathematics Qualification
Higher Level
June 2014

Financial Calculations

4984

Unit 4

Thursday 22 May 2014 9.00 am to 10.15 am

For this paper you must have:

- a clean copy of the Data Sheet (enclosed)
- a calculator
- a protractor
- a ruler.

Time allowed

- 1 hour 15 minutes

Instructions

- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page.
- Do all rough work in this book. Cross through any work that you do not want to be marked.
- You may **not** refer to the copy of the Data Sheet that was available prior to this examination. A clean copy is enclosed for your use.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 50.
- You are expected to use a calculator where appropriate.

Advice

- In all calculations, show clearly how you work out your answer.

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
TOTAL	



J U N 1 4 4 9 8 4 0 1

Section A

Answer **all** questions.

Answer each question in the space provided for that question.

Use **Shoes 4 U** on page 2 of the Data Sheet.

- 1 (a) Olivia works in the shop.
She buys a pair of shoes which are on sale at £52.
She is given the staff discount of 16%.
How much does Olivia pay?

[3 marks]

$$16\% = 0.16$$

$$\text{Discount by } 16\% \quad 1 - 0.16 = 0.84$$

$$£52 \times 0.84 = £43.68$$

Answer.....

$$£43.68 \quad \checkmark$$

3

- 1 (b) At the beginning of a week, 'Shoes 4 U' had 180 pairs of shoes in stock.
During the week, the shop sold 140 of these pairs of shoes.

Express the number of pairs of shoes **not** sold in the week as a fraction of the number of pairs of shoes in stock at the beginning of the week.

Give your answer in its simplest form.

[2 marks]

$$\frac{40}{180} = \frac{10}{45} = \frac{2}{9}$$

(Handwritten simplification steps: 40/180 divided by 4 gives 10/45; 10/45 divided by 5 gives 2/9)

Answer.....

$$\frac{2}{9} \quad \checkmark$$

2

- 1 (c) Maha buys two bags.
Each bag costs £9, correct to the nearest pound.

What is the maximum possible price that Maha pays for the two bags?

[2 marks]

$$\text{UB of cost per bag} = £9 + 0.49$$

$$= £9.49$$

$$\text{Maximum cost of 2 bags} = 9.49 = £18.98$$

Answer.....

$$£18.98 \quad \checkmark$$

2



- 1 (d) Jeremy goes to 'Shoes 4 U' to buy a pair of men's shoes.

The shop offers a reduction of $\frac{1}{3}$ of the normal price. However, Jeremy needs size 14 shoes. This large size has a 25% surcharge added to the sale price of the shoes.

What percentage reduction in the original price is Jeremy given?

[4 marks]

$$\left(100 \times \frac{2}{3}\right) \times 1.25 = 83\frac{1}{3}$$

$$\text{Discount} = 100 - 83\frac{1}{3}$$

$$= 16\frac{2}{3}\%$$

Answer... $16\frac{2}{3}\%$ ✓

4

11

Turn over for the next question

Turn over ►



Section B

Answer **all** questions.

Answer each question in the space provided for that question.

Use **Bank accounts** on page 2 of the Data Sheet.

- 2 Jose deposits £4260 in the Nine Carat Account for 24 months.
It earns compound interest at the rate of 1.59% paid every 6 months.

	Starting value (£)	Interest (£)	Final value (£)
First 6 months	4260.00	67.73	4327.73
Second 6 months	4327.73	68.81	4396.54
Third 6 months	4396.54	69.90 ✓	4466.44 ✓
Fourth 6 months	4466.44	71.02 ✓	4537.46 ✓

- 2 (a) Complete the table above.

[4 marks]

Space for working

$$1.59\% = 0.0159$$

$$4396.54 \times 0.0159 = 69.90$$

$$4466.44 \times 0.0159 = 71.02$$

- 2 (b) Find the total interest which Jose has received in the 24 months.

[1 mark]

$$67.73 + 68.81 + 69.90 + 71.02 =$$

Answer.....

$$£277.46$$



Section C

Answer **all** questions.

Answer each question in the space provided for that question.

Use **Price comparison** on page 3 of the Data Sheet.

3

ALWAYS divide by the "percentage of" amount.

	A	B	C	D
1	Item	Price in London	Price in Boston	Price in Boston as a percentage of price in London
2	Apple iPod Nano	£115.00	£87.74	76.3% ✓
3	Elizabeth Arden '8 hour cream'	£25.00	£11.56	46.2% ✓
4	Women's 'Roxanne' skinny jeans	£160.00	£101.79	63.6% ✓
5	Sesame Street Let's Rock Elmo	£85.00	£40.13	47.2% ✓

The prices were correct in November 2011.

- 3 (a) Complete the spreadsheet above to give the price in Boston as a percentage of the price in London.

Give the percentages to one decimal place.

[4 marks]

Space for working $\frac{87.74}{115.00} \times 100\% = 76.3\% \text{ (1d.p.)}$

$$\frac{11.56}{25} \times 100\% = 46.2\%$$

$$\frac{101.79}{160} \times 100\% = 63.6\%$$

$$\frac{40.13}{85} \times 100\% = 47.2\%$$

4

- 3 (b) State a formula which would give the content of cell D3.

[1 mark]

$$= (C3/B3) \times 100 \quad \checkmark \quad \text{or} \quad \frac{C3}{B3} \times 100$$

1

Answer.....

5

Turn over ►



- 4 (a) Kate flew to Boston. **REVERSE PERCENTAGE**
She paid £65 for UK air passenger duty. This duty was 13.4% of the cost of her return ticket to Boston.

How much did Kate pay for her return ticket to Boston?

[3 marks]

13.4%	1%	100%
£65	£4.8507	£485.07

$$1\% = 65 \div 13.4 = 4.8507462686567$$

Answer... **£485.07** ✓

3

- 4 (b) In Boston, Kate paid \$192 for each night she stayed in a hotel.
The exchange rate was \$1.61 to £1.

Calculate the cost, in pounds, of each night in the hotel.

[3 marks]

$$\begin{aligned} \text{Cost in } \pounds &= \$192 \div \$1.61 \\ &= \pounds 119.25 \text{ (2dp)} \end{aligned}$$

Answer... **£119.25** ✓

3

- 4 (c) Kate had dinner with her friend Harry. The total cost of the dinner was \$84.
They agreed to divide the cost of their dinner in the ratio of 4:3, with Kate paying more.

How much, in dollars, did Kate pay?

[3 marks]

$$\begin{aligned} \text{Number of shares} &= 4 + 3 = 7 \\ 1 \text{ share} &= \$84 \div 7 = \$12 \\ \text{Kate pays} &= \$12 \times 4 = \$48 \end{aligned}$$

Answer... **\$48** ✓

3



4 (d)

There were 212 passengers on a plane.

The total weight of their luggage was 3941 kg. **ROUND TO 1 SF THEN CALCULATE**

Using approximations, estimate the average weight of each passenger's luggage.

You must show your approximations and all your working.

[3 marks]

200 passengers **Total weight = 4000 kg****4000 kg ÷ 200 passengers = 20 kg**

Answer.....

20 kg ✓

3

12

Turn over for the next question

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Section D

Answer **all** questions.

Answer each question in the space provided for that question.

Use **Firm Foundation Credit Services** on page 3 of the Data Sheet.

- 5 Lynn needs some money to start a small business. She decides to borrow £3250 and to repay the loan over 36 months.

- 5 (a) Write down the monthly repayment which Lynn will make.

READ MONTHLY REPAYMENT FROM DATA SHEET

[1 mark]

Answer.....

£119.48 ✓

- 5 (b) By finding the total repayments which Lynn will make to repay the loan, calculate the total interest which she will be charged for borrowing this money.

[3 marks]

$$\text{TOTAL PAYMENT} = £119.48 \times 36 = £4301.28$$

$$\begin{aligned} \text{INTEREST PAID} &= £4301.28 - £3250 \\ &= £1051.28 \end{aligned}$$

Answer.....

£1051.28 ✓

- 5 (c) Express the total interest which Lynn will be charged for borrowing this money as a percentage of the amount borrowed.

[2 marks]

$$\frac{1051.28}{3250} \times 100\% = 32.3\% \text{ (3sf)}$$

Answer.....

32.3% ✓



Section EAnswer **all** questions.

Answer each question in the space provided for that question.

Use **Taxation 2013–2014** on page 4 of the Data Sheet.

- 6** Sarah earned £3782 per month and had a tax-free allowance of £9205.

Calculate:

- 6 (a)** Sarah's taxable income;

[3 marks]

$$\text{ANNUAL INCOME} = 12 \times \pounds 3782 = \pounds 45384$$

$$\begin{aligned} \text{TAXABLE INCOME} &= \pounds 45384 - \pounds 9205 \\ &= \pounds 36179 \end{aligned}$$

Answer.....

$$\pounds 36179 \checkmark$$

- 6 (b)** the amount of income tax which Sarah paid in the year.

[5 marks]

$$\begin{aligned} \text{INCOME TAXED AT 40\%} &= \pounds 36179 - \pounds 32245 \\ &= \pounds 3934 \checkmark \end{aligned}$$

$$\text{TAX @ 40\%} = \pounds 3934 \times 0.4 = \pounds 1573.60 \checkmark$$

$$\text{TAX @ 20\%} = \pounds 32245 \times 0.2 = \pounds 6449.00 \checkmark$$

Answer.....

$$\pounds 8022.60 \checkmark$$

3

5

8

Turn over for the next question

Turn over ►



Section F

Answer **all** questions.

Answer each question in the space provided for that question.

7

The annual rate, R , expressed as a decimal, at which a principal, $\pounds P$, would increase to an amount, $\pounds A$, in n years is given by the following formula.

starting
amount

$$R = \sqrt[n]{\frac{A}{P}} - 1$$

final amount

A - value of investment
after 5 yearsP - value of investment
at start of 5 years

An investment of $\pounds 2800$ has grown to $\pounds 3412$ in five years.

Find the annual rate of interest on this investment, expressed as a percentage.

[3 marks]

$$R = \sqrt[5]{\frac{3412}{2800}} - 1 = 0.04032778615$$

$$0.04032778615 \times 100\% = \text{Answer } 4.03\% \text{ (3sf)} \checkmark$$

3

3

END OF QUESTIONS



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Section C: 'Fly to the U.S. and save hundreds on Christmas list of leading brands' by Sean Poulter, *Daily Mail*, 17 November 2011.

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