HIGHER

# 3.9H Exchange Rates: Higher Tier Practice

Total Marks

EDEXCEL Edexcel 1MA1 · Calculator allowed · about 70 minutes

Name: _____ Date: ____ / ____ / _____

**Answer ALL questions. Show all your working.**

**1** The exchange rate is 1 pound = 1.17 euros. Amelia changes 60 pounds into euros.

**(Total for Question 1 is 2 marks)**

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**2** A currency board shows 1 US dollar = 0.85 pounds and 1 euro = 1.12 US dollars.
Part (a): Convert 120 US dollars to pounds.
Part (b): Convert 90 euros to pounds using the two rates.

**(a)** Convert 120 US dollars to pounds. **(1)**

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**(b)** Convert 90 euros to pounds using the rates given. **(2)**

.....

**(Total for Question 2 is 3 marks)**

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**3** A bank changes its rate from 1 pound = 1.25 euros to 1 pound = 1.18 euros.
Calculate the percentage decrease in the number of euros you get for each pound. Give your answer to 2 decimal places.

**(Total for Question 3 is 4 marks)**

**4** A travel agent buys euros at a wholesale rate of 1 pound = 1.30 euros and sells to customers at 1 pound = 1.22 euros. Emma needs 260 euros for a trip and buys these euros from the agent.
Part (a): How many pounds does Emma pay when buying 260 euros from the agent at the selling rate?
Part (b): If the agent bought the euros at the wholesale rate, calculate the agent's gross profit in pounds on Emma's transaction. Give your answer to 2 decimal places.

**(a)** How many pounds does Emma pay to get 260 euros at the agent's selling rate of 1 pound = 1.22 euros? **(2)**

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**(b)** If the agent acquired the 260 euros at the wholesale rate 1.30 euros per pound, calculate the agent's gross profit in pounds on Emma's purchase. **(3)**

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**(Total for Question 4 is 5 marks)**

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**5** Show that if the exchange rate from pounds to x-currency is R x per pound and from x-currency to y-currency is S y per x-unit, then the direct rate from pounds to y-currency is R * S y per pound.
Use algebra to demonstrate this and give a short numerical example with R = 1.6 and S = 0.7 to illustrate.

**(Total for Question 5 is 6 marks)**

**6** A person wants to change 500 pounds to Japanese yen (JPY). The exchange rates available are:
Bank A: 1 pound = 155.4 JPY with a commission of 0.5% on the pound amount.
Bank B: 1 pound = 154.1 JPY with no commission.
Part (a): Calculate how many JPY the person receives from Bank A after paying commission. Give your answer to the nearest whole JPY.
Part (b): Calculate how many JPY the person receives from Bank B. Which bank gives the better deal? Show your working.

**(a)** How many JPY are received from Bank A after paying 0.5% commission on the 500 pounds? **(3)**

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**(b)** How many JPY are received from Bank B, and which bank is better? **(3)**

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**(Total for Question 6 is 6 marks)**

**7** Kwame is planning a trip to Canada. He estimates he will spend 1,450 Canadian dollars (CAD). The quoted rate is 1 pound = 1.72 CAD.
He can pre-buy CAD now or wait, but the travel company charges an additional fixed fee of 12 pounds if he waits and buys at the airport rate which is 1 pound = 1.66 CAD.
Part (a): Calculate how many pounds Kwame needs to pre-buy 1,450 CAD now at the quoted rate. Give your answer to 2 dp.
Part (b): Calculate how many pounds he would need if he waits and buys at the airport rate including the 12 pound fee. Which option is cheaper and by how many pounds? Give your answer to 2 dp.

**(a)** How many pounds to buy 1,450 CAD now at 1.72 CAD per pound? **(3)**

**(b)** How many pounds if he waits and buys at 1.66 CAD per pound with an extra 12 pound fee? Which option is cheaper and by how many pounds? **(5)**

**(Total for Question 7 is 8 marks)**

**8** An online trader spots an arbitrage opportunity between three currencies. The rates are:
1 pound = 1.45 euros,
1 euro = 130 Japanese yen (JPY),
1 JPY = 0.0068 pounds.
Start with 10,000 pounds and exchange pounds -> euros -> JPY -> pounds using the rates above. Calculate the final amount of pounds received. Is there a profit or loss? Give your answer to 2 decimal places and state the percentage gain or loss relative to the starting 10,000 pounds to 2 dp.

**(Total for Question 8 is 6 marks)**

# Mark scheme · 3.9H Exchange Rates: Higher Tier Practice

## Question 1

- **M1** correct method: multiply 60 by 1.17 or show 60 * 1.17
- **A1** 70.2 euros cao
- **Answer: 70.20 euros (or 70.2 euros).**

## Question 2

- (a) **B1** 102 pounds cao
- **(a) Answer: 102 pounds**
- (b) **M1** convert euros to dollars then to pounds or combine rates: 90 * 1.12 * 0.85
- (b) **A1** 85.68 pounds cao
- **(b) Answer: 85.68 pounds**

## Question 3

- **M1** find decrease 1.25 - 1.18 = 0.07 or show correct percentage method
- **M1** method to find percentage: 0.07 / 1.25
- **A1** 5.6% (or 5.60%) to 2 dp
- **B1** answer given to 2 dp: 5.60% cao
- **Answer: 5.60% decrease. Working: decrease = 0.07; percentage = 0.07/1.25 = 0.056 = 5.60%.**

## Question 4

- (a) **M1** method: divide euros by rate 260 / 1.22
- (a) **A1** 213.11 pounds to 2 dp cao
- **(a) Answer: 213.11 pounds**
- (b) **M1** method: find cost in pounds at wholesale 260 / 1.30
- (b) **M1** subtract cost from amount paid: 213.11475... - (260/1.30)
- (b) **A1** 13.11 pounds to 2 dp cao
- **(b) Answer: 13.11 pounds**

## Question 5

- **dM1** use of algebra: 1 pound = R x-units, then R x-units = R * S y-units
- **M1** conclude direct rate is R * S y per pound
- **M1** numerical substitution with R = 1.6 and S = 0.7: compute 1.6 * 0.7
- **A1** 1.12 y per pound cao (numerical result correct)
- **M1** give a clear worked example showing conversion e.g. 10 pounds -> 10*1.6 = 16 x-units -> 16*0.7 = 11.2 y-units
- **A1** final example values correct and consistent: 10 pounds = 11.2 y
- **Answer: Algebra: 1 pound = R x; 1 x = S y so 1 pound = R * S y. Numerical: R* S = 1.6 * 0.7 = 1.12. Example: 10 pounds -> 10*1.6 = 16 x -> 16*0.7 = 11.2 y. Shown: 1 pound = 1.12 y.**

## Question 6

- (a) **M1** find commission: 0.5% of 500 = 2.5 pounds or show 500 * 0.005
- (a) **M1** subtract commission to find net pounds: 500 - 2.5 = 497.5
- (a) **A1** receive 497.5 * 155.4 = 77,312 JPY (to nearest whole) cao
- **(a) Answer: 77,312 JPY**
- (b) **M1** method: 500 * 154.1 = 77,050 JPY
- (b) **M1** compare 77,312 with 77,050
- (b) **A1** Bank A better by 262 JPY cao
- **(b) Answer: Bank B gives 77,050 JPY. Bank A is better by 262 JPY (77,312 - 77,050).**

## Question 7

- (a) **M1** method: divide 1,450 by 1.72
- (a) **M1** calculate 1,450 / 1.72
- (a) **A1** 843.02 pounds to 2 dp cao
- **(a) Answer: 843.02 pounds**
- (b) **M1** method: compute pounds for CAD at airport rate 1,450 / 1.66
- (b) **M1** add 12 pound fee
- (b) **M1** subtract pre-buy cost from airport total to find difference
- (b) **A1** airport total 885.49 pounds to 2 dp
- (b) **A1** state cheaper option: pre-buy cheaper by 42.47 pounds to 2 dp cao
- **(b) Answer: If waiting: 1,450 / 1.66 = 873.4939759 -> 873.49 plus 12 = 885.49 pounds. Pre-buy cost 843.02, so pre-buy is cheaper by 42.47 pounds. Final to 2 dp: airport total 885.49 pounds; pre-buy cheaper by 42.47 pounds.**

## Question 8

- **M1** convert 10,000 pounds to euros: 10,000 * 1.45
- **M1** convert euros to JPY: previous result * 130
- **M1** convert JPY to pounds: previous result * 0.0068
- **A1** final pounds value computed correctly to 2 dp
- **M1** compute profit/loss and show sign
- **A1** percentage gain/loss relative to 10,000 given to 2 dp
- **Answer: Start: 10,000 pounds -> euros = 10,000 * 1.45 = 14,500 euros. -> JPY = 14,500 * 130 = 1,885,000 JPY. -> pounds = 1,885,000 * 0.0068 = 12,818.00 pounds. Profit = 12,818.00 - 10,000 = 2,818.00 pounds. Percentage gain = (2,818 / 10,000) * 100 = 28.18% gain (to 2 dp).**