Level 3 Mathematical Studies 1350
Exemplar questions

Introduction

These questions are examples of the types of individual questions which may be given in a live Level 3 Mathematical Studies paper. They do not represent a whole paper.

Questions

1. Linda currently earns £27 300 per year. She is offered either a 3.5% annual pay rise or an increase of £1000 per year for the next 4 years.

    Which offer would you advise Linda to take?
    Explain your answer.

    [4 marks]

2. Jed travels to a meeting by car.
    The meeting is 37 miles from his house.
    He can claim money back from his company for his journey to and from the meeting at a rate of 40p per mile.

    How much can Jed claim for his journey? Circle your answer.

    a. £296.00   b. £14.80   c. £148.00   d. £29.60

    [1 mark]

3. Sita has just graduated from university.
    She has obtained a job earning £15 500 per year.
    She predicts that her wage will increase by 2.5% per year.

    a.   After how many years of work will Sita have to start paying back
         her student loan?

    [2 marks]

    b. How much of her student loan will Sita pay in the first year?

    [1 mark]

4. John buys a new car for £13 250
    He intends to sell it after 5 years.
    He has been informed that the average depreciation of a car on resale is 15%

    What will the resale value of the car be?

    [2 marks]

5. Nigel is getting ready on the morning of a job interview.

   In the table below, list at least six separate activities this might involve.

   For each activity, indicate its likely duration and state the immediately preceding activities.

   [5 marks]

Activity	Immediate predecessor	Duration (minutes)

6. Hannah and her partner would like to buy a house which is on the market for £240 000
   They have a joint income of £60 857 and have savings of £38 000
   They will also use some of their savings as the deposit.

   They can borrow up to 3.5 times their joint income from their mortgage lender.

   If they borrow the maximum amount from their mortgage lender:

   a) how much deposit will they need?

   [3 marks]

   b) what percentage of the purchase price will this be?

   [2 marks]

7. Estimate the number of times a person will blink in one year.

   Show details of your assumptions and calculations.

   [4 marks]

8. Estimate the number of burgers a person will have eaten by the age of 16.

   Show details of your assumptions and calculations.

   [4 marks]

9. Estimate the number of people in the UK who have a birthday in the month of March.

   Show details of your assumptions and calculations.

   [3 marks]

Mark Scheme

Q	Answer	Mark	Comments
1	£27 300 x 0.035 = £955.50 for 1st year £27 300 x 1.035^4 = £31 327.38	M1	Repeated for next 3 years 2nd year Rounded to 2dp for money
	£31 327.38 – £27 300 = £4027.38 Total increase	M1	
	Four years at £1000 per year £4000		
	Argument taking £1000 per year better in the first two years Argument taking the 3.5% better over the 4 years giving a total of £31 327.38 – £27 300 = £4027.38 which is greater than £4000 Or by the end of the fourth year she will be earning more £31 327.38 rather than £31 300	E1 A1	
2	Option d indicated 37 x 2 x 0.4 = £29.60	B1	
3a	£15 500 x 1.025 = £15 887.50 £15 887.50 x 1.025 = £16 284.69 £16 284.69 x 1.025 = £16 691.80 After 3 years	M1 A1	
3b	Earnings over £16 365 are £326.80 9% of £326.80 0.09 x £326.80 = £29.41	B1	
4	£13 250 x 0.85^5 = £5879.10 Or 15% found and taken away from the new amount each time repeated 5 times	M1 A1	Do not accept £13 250 – (5x £147.50)
5	Any list of 2+ relevant activities	M1	
	At least 6 relevant activities	M1	
	Directions given	M1	
	Precedencies given	M1	
	Clear and relevant solution	A1	
6a	£60 857 x 3.5 = £212 999.50	M1	
	£240 000 – £212 999.50 = £27 000.50	M1 A1	Deposit needed
6b	$\frac{£27\ 000.50}{£240\ 000}$ x 100 = 11.25%	M1 A1	
7	Assumption/est. for number of blinks per minute (b)	B1	
	b x 60 x 24 (d)	M1	Number of blinks per day
	d x 365 d x 366 stating leap year	M1 A1	

8	Assumption for age a child starts eating burgers	B1	
	Estimate for number of burger per week/year (y)	B1	If per week value x 52 to give year
	y x (16 – their assumption for starting age)	M1 A1	
9	Estimate of number of people in UK Calculation their population ÷ 12	B1	64.1 million in UK
	Extra weighting given and an attempt to interpolate due to 31 days in March	M1 A1	Population ÷ 365 x 31