Section C

- This section has three questions

- This section is marked out of 100

- The marks achieved in this section account for 25% of your final exam result

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Instructions:

Answer all three questions. Questions 1 and 2 carry 40 marks each, question 3 carries 20 marks. Round your answers to two decimal places. Always carefully explain how you got your results. Calculators are permitted.

Question 1

Stephanie wants to buy a new computer at a cash price of £870 (including Value Added Tax (VAT)). Unfortunately, she does not have enough money at this point to pay for it. The electronics store offers the following two financing options:

Option 1:
pay a 15% deposit now and 12 monthly payments of £64.

Option 2:
pay £900 at the end of one year

(a) Assume Stephanie chooses option 1.

    (i) How much more than the cash price does she pay overall?

    (9)

    (ii) By what percentage of the cash price does she overpay?

    (5)

(b) Now assume that Stephanie chooses option 2.

    (i) What is the implied yearly interest rate?

    (9)

(ii) What is the implied monthly compound interest rate?

(5)

(c) Stephanie finds out that the electronics store is running a 'VAT-back offer': Any customer buying a computer within the next two weeks will be refunded the 20% Value Added Tax. What is the computer's cash price under the 'VAT-back-offer'?

(6)

(d) Stephanie discovers that a different store is also running a special offer for computers: 20% of the final price (including VAT, i.e. £870) will be taken off every customer's bill. Which of the two offers, (c) or (d), should Stephanie go for and why?
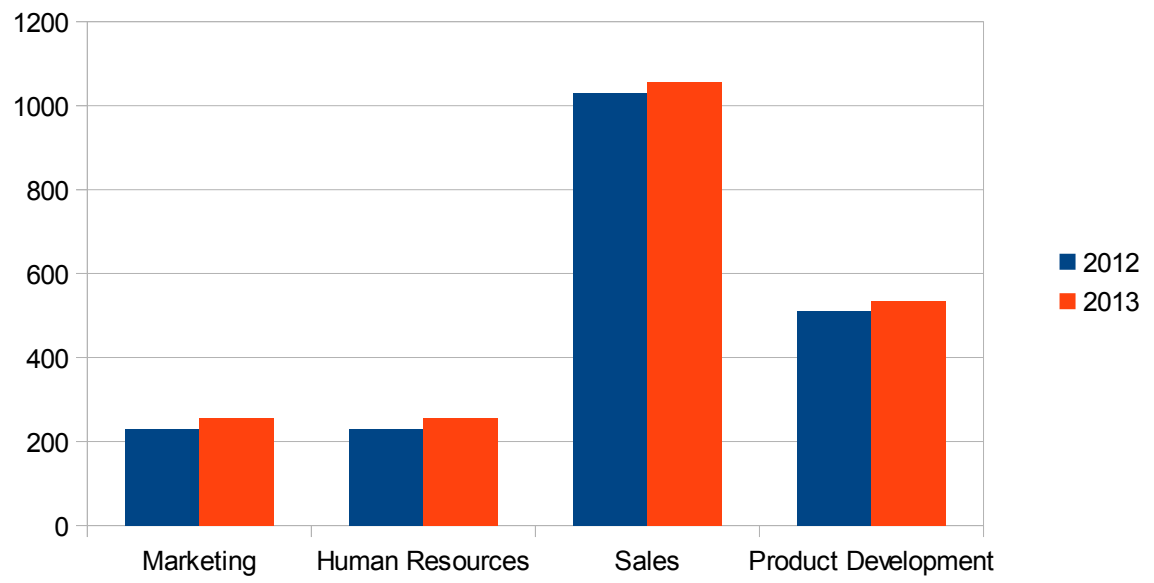
(6)

Question 2

The table below gives the number of employees in the software company 'Pear', grouped by gender and department.

	female	male
Marketing	130	120
Human Resources	80	170
Sales	360	640
Product Development	160	340

(a) What percentage of 'Pear' employees are women?

(8)

(b) What percentage of 'Pear' employees in the sales department are men?

(8)

(c) Draw an accurate pie chart illustrating the distribution of employees over the different departments (do not differentiate between male and female employees).

(8)

(d) Assume 'Pear' hires 20% more women in the sales department. What is the percentage of female employees in the sales department after this changes?

(8)

(e) As the company is becoming more and more successful, Mandy the manager is thinking of increasing the number of employees in each department by 10% for 2013. Does the diagram below correctly represent this change? Why or why not?
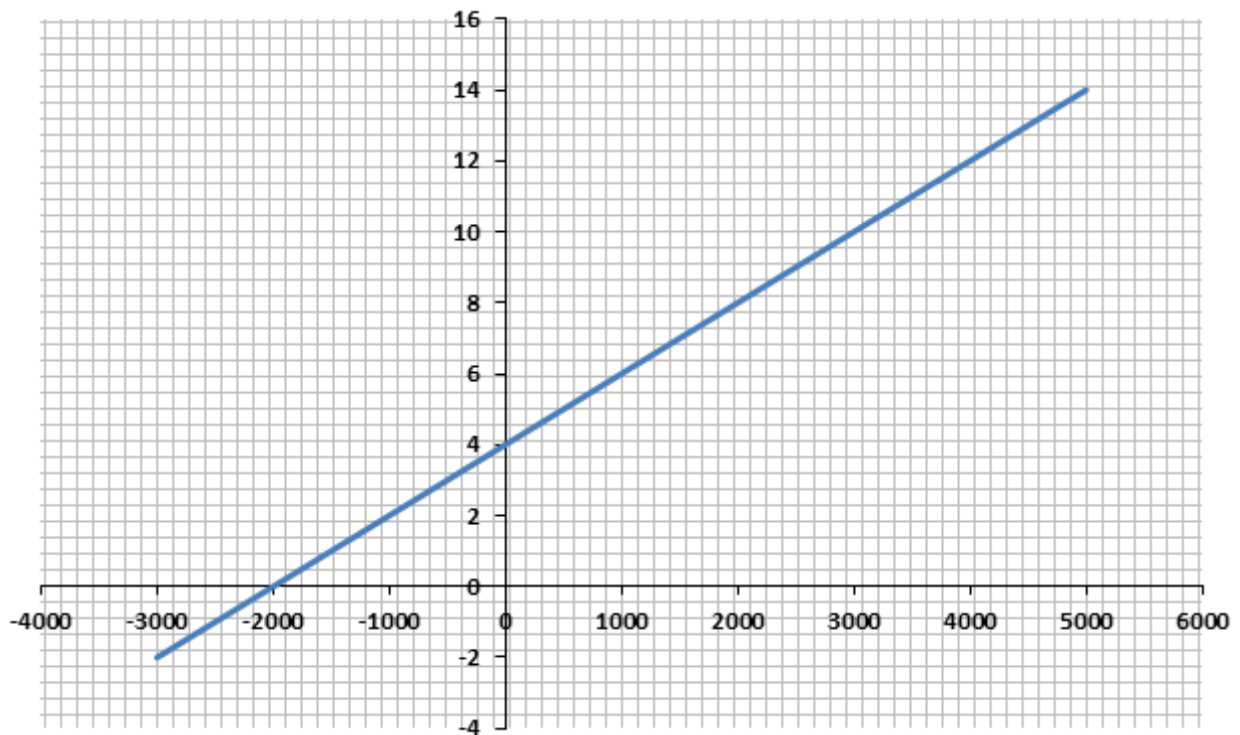
(8)

The amount of flour (measured in grams) needed to produce bread (measured in loaves) is given by the formula:

$$loaves\ of\ bread = \frac{grams\ of\ flour + a}{500}$$

(a) Use the graph below to find the value of a.

(8)

(b) How many grams of flour do you need to produce 12 loaves of bread?

(4)

(c) Solve $8t + 8 = 3(2t + 5)$.

(8)