

Pre-assessment 1

ANSWERS

Student Name: _____ **Course/Class** _____

I understand the conditions of this pre-assessment and the policy on plagiarism.
In signing, I declare that the evidence presented throughout the unit is my own work,
acknowledging all sources of reference and providing citation as appropriate.

Student Signature: _____ **Date:** _____

Assessment will show feedback from the lecturer and result.
Lecturer (assessor) will sign and record on register.

Result: _____ **Date:** _____

Unit Title: Numeracy at SCQF Level 5

Unit Code: F3GF 11

Conditions of Pre-Assessment (Assessment will be supervised)

Classroom (Open Book)	☐	Practical	☐
Classroom (Closed Book)	☒	Written	☒
Home-Based (Open Book)	☐	On-line	☐
Other	☐	Supervised	☐
Duration of Pre-Assessment:		Approx. 60 mins	
Resources Required:		Calculator, graph paper, ruler, compasses, protractor	
Pass Mark:		All responses correct	

Unit Title: Numeracy at SCQF Level 5

Unit Code: F3GF 11

QUESTION 1:

You work in Scotland and earn a gross salary of £89,358.05 per annum.

Using the fictional (for the purpose of this Pre-Assessment) tax bands, calculate the amount of tax contributions for the year, showing all your calculations and final answer to currency with 2 decimal places.

Personal Allowance £12,570

Income Tax Rates & Taxable Bands:

Starter Rate of tax (19%)	£12,570 - £15,397
Scottish Basic Rate (20%)	£15,397 - £27,491
Intermediate Rate (21%)	£27,491 - £43,662
Higher Rate (42%)	£43,662 - £75,000
Advanced Rate (45%)	£75,000 - £125,140
Top Rate (48%)	Over £125,140

ANSWER:

Step 1: Calculate Taxable Income

Personal Allowance: £12,570

Taxable Income = £89,358.05 - £12,570 = **£76,788.05**

Step 2: Apply Income Tax Bands

Tax Band	Band Range (£)	Taxable Amount (£)	Rate (%)	Tax Due (£)
Starter Rate	£12,570 – £15,397	£2,827	19%	$£2,827 \times 0.19 = £537.13$
Scottish Basic Rate	£15,397 – £27,491	£12,094	20%	$£12,094 \times 0.20 = £2,418.80$
Intermediate Rate	£27,491 – £43,662	£16,171	21%	$£16,171 \times 0.21 = £3,395.91$
Higher Rate	£43,662 – £75,000	£31,338	42%	$£31,338 \times 0.42 = £13,161.96$
Advanced Rate	£75,000 – £89,358.05	£14,358.05	45%	$£14,358.05 \times 0.45 = £6,461.12$
Top Rate	Over £125,140	£0	48%	£0.00

Step 3: Total Tax Contribution

Total Tax Due = £537.13 + £2,418.80 + £3,395.91 + £13,161.96 + £6,461.12

Total Tax Contribution: **£25,974.92**

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QUESTION 2:

You and your partner wish to purchase a house. You have savings held in Germany of Euro 23,000 and you receive a gift from a rich aunty in the USA for the amount of \$11,500 which is sent to you at current exchange rates.

You decide to apply for a bank loan / mortgage. The bank uses the following formula to calculate the maximum loan amount available.

$$\text{Maximum Loan} = 2\frac{3}{4}p + 1\frac{1}{2}s$$

Where $p = \text{principal salary}$

$s = \text{second salary}$

You have a salary of £42,349 and your partner earns £33,476

The legal fees amount to £5,920

Current exchange rates as per your bank is £1:Euro 1.14 and £1:\$1.42

How much money could you have available to buy a house to the nearest whole pound?

ANSWER:

Step 1: Convert Gift / Savings to Pounds (£)

Source	Foreign Currency	Exchange Rate	Amount in £	Notes
Savings Germany	€ 23,000	€ 1.14 per £1	£ 20,175.44	(23,000 ÷ 1.14)
Gift from U.S.	US\$ 11,500	US\$ 1.42 per £1	£ 8,098.59	(11,500 ÷ 1.42)
Total Amounts in £ added together:			£28,274.03	

Step 2: Compute Maximum Loan Available

Bank's formula: Maximum Loan = $2\frac{3}{4}p + 1\frac{1}{2}s = 2.75p + 1.5s$

Where

(p =) your salary = £42,349 and (s =) partner's salary = £33,476

Therefore: (2.75 x £42,349 = £116,459.75) and (1.5 x £33,476 = £50,214.00)

Combined (added together) = £116,459.75 + £50,214.00 = £166,673.75

Step 3: Total Funds Available (Loan + Savings) minus Legal Fees

Loan available: £166,673.75 plus Converted savings/gift: £ 28,274.03 minus Legal fees: £ 5,920.00 = £189,027.78 rounded off to the nearest whole pound: **£189,028**

Final Answer: You would have **£189,028** available to purchase a house (after paying legal fees).

Lecturer: Mark Gillan

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QUESTION 3:

You decide to take out a loan for £8,500 over a period of 60 months to buy a second-hand car.

The interest rate charged by the loan company is a constant 8.2% per annum for the term of the loan.

Calculate the total amount payable to three significant figures, noting the loan company uses the following formula to calculate the total amount payable.

$$A = B (1+i)^n$$

Where:

A = total amount payable

B = amount borrowed

i = annual interest rate as a decimal

n = term of the loan (in years)

ANSWER:

Loan Details:

Amount borrowed (B): £8,500

Annual interest rate (i): 8.2% = 0.082

Term of loan: 60 months = 5 years

Formula Used:

$$A = B(1 + i)^n$$

Where:

(A) = total amount payable

(B) = amount borrowed = £8,500

(i) = annual interest rate (as decimal) = 0.082

(n) = term of the loan in years = 5

Calculations:

$$A = 8500 \times (1 + 0.082)^5$$

$$A = 8500 \times (1.082)^5$$

$$A = 8500 \times 1.485947$$

$$A = 12,580.55$$

Final Answer: £12,600 (to 3 significant figures)

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QUESTION 4:

Mary-Jane works a standard 38 hour week earning a standard basic pay of £28.50 per hour, working 9 am to 5 pm Monday to Friday only.

Last week on Monday Mary-Jane worked 9 am to 8 pm, Tuesday was 8.40 am to 7.10 pm.

Wednesday, Thursday, Friday were all 9 am to 5 pm.

Saturday it was 8 pm to midnight. Sunday was 4.20 am to 8.50 am.

The employer pays overtime during the week at time and a quarter and for a Saturday at time and a half, Sunday overtime is 15% above the Saturday overtime rate. Overtime is paid for full hours worked only, not part thereof, based upon the total for each relevant day.

How much does Mary-Jane earn gross pay for the full week including overtime?

Show all your calculations and the answer to currency 2 decimal places.

ANSWER:

Step 1: Standard Pay

Standard pay = 38 hrs × £28.50 = **£1,083.00**

Step 2: Overtime Hours Calculation

Monday: 9 am – 8 pm = 11 hours	Tuesday: 8:40 am – 7:10 pm = 10.5 hours	Wednesday to Friday:
- Standard hours: 8 hrs - Overtime: 11–8 = 3 full hours	- Full hours worked = 10 - Overtime: 10–8 = 2 full hrs	Standard 9 am – 5 pm → no overtime
Saturday: 8 pm – midnight = 4 full hours	Sunday: 4:20 am – 8:50 am ≈ 4.5 hours → counted as 4 full hours (only full hours paid)	
All 4 hours are overtime @ Sat rate	All 4 hours are overtime @ Sun rate	

Step 3: Overtime Pay Calculations

Weekday Overtime (Time and a Quarter = 1.25×):

Overtime hours: 3(Mon)+2(Tues)=5 hrs

Overtime rate: £28.50 × 1.25 = £35.625

Weekday OT pay: 5 × £35.625 = **£178.13**

Saturday Overtime (Time and a Half = 1.5×):

Saturday rate: £28.50 × 1.5 = £42.75

Saturday OT pay: 4 × £42.75 = **£171.00**

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Sunday Overtime (15% above Saturday rate):

Sunday rate: $\pounds 42.75 \times 1.15 = \pounds 49.1625$

Sunday OT pay: $4 \times \pounds 49.1625 = \pounds 196.65$

Step 4: Total it all up for Gross Pay

Description	Amount (£)
Standard Pay	£1,083.00
Weekday Overtime	£178.13
Saturday Overtime	£171.00
Sunday Overtime	£196.65
Total Gross Pay =	£1,628.78

Final Answer: **£1,628.78**

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QUESTION 5:

You work for a company selling a product related to your studies at college.

They normally sell 25 large boxes for every 3 small boxes sold.

After a successful advertising campaign, the total number of boxes sold in one month increases to 288 boxes in total with the same split as previous between large and small boxes.

How many large boxes are sold that month?

ANSWER:

Step 1: Understand the ratio

- The ratio of large : small boxes is 25 : 3
- Total parts = $25 + 3 = 28$ parts

Step 2: Total number of boxes sold

After the advertising campaign, total boxes sold = 288

Step 3: Value of one part

$$\text{One part} = \frac{288}{28} = 10.2857...$$

Step 4: Calculate number of large boxes

$$\text{Large boxes} = 25 \times 10.2857 = 257.14$$

Since you can't sell part of a box and the split remains exactly as before, we take the whole number of boxes only.

Final Answer: 257 large boxes sold

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QUESTION 6:

Janine wants to upgrade her home office.

Janine has £1,200 in cash, an old camera lens from her friend in Ireland bought 4 years ago for Euro 2,000 that the bank will accept as part of the collateral, but the bank will calculate the depreciation on the camera lens at 95 pence for each of the 4 years.

The bank will use the following formula to calculate the maximum loan offer.

$$L = 2 \frac{3}{4} c - (3\% \text{ of } c) + (a \times d^4)$$

Where **L = Maximum Loan Amount**
 c = cash
 a = assets (in Pounds Sterling)
 d = depreciation at 95 pence in Pounds & Pence (£)

Current exchange rates as per your bank is 1 Euro = 86 pence

Using the formula, how much of a loan could Janine have available to upgrade her home office to the nearest whole pound?

ANSWER:

Step 1 Currency Conversion (Euros to Pounds)

Euro 2,000 x £0.86 = £1,720.00

(Remember, larger number remains larger number in conversion, but also noting it is relative proportionate to the increase from the base exchange rate – what you do on one side, you do on the other too, so multiply the 1 Euro by 2,000 and then multiply the 0.86 by 2,000 as well)

Step 2 Working through the formula using BODMAS

Step 2(a): First Brackets being 3% of c which is $0.03 \times 1,200 = 36$

Step 2(b): Second set of brackets Important is 95 pence in £ is £0.95 (it is 0.95) to the power of 4.

Being $a \times 0.95^4$ therefore orders need to be done before multiplying by a (assets) ...

$0.95 \times 0.95 \times 0.95 \times 0.95 = 0.81450625 \times a$ (assets) which is $1720.00 = 1400.95$

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Reviewing the formula with brackets calculated and results placed above the brackets to see what has been done so far (both brackets calculated)...

$$L = 2 \frac{3}{4} c - (36) + (1400.95)$$

Therefore, formula now reads $L = 2 \frac{3}{4} c - 36 + 1400.95$

Step 2(c): Start of formula for multiplication next, being $2 \frac{3}{4} \times c$

Convert fraction to decimal and then multiply c which is 1200.00

$$2.75 \times 1200.00 = 3300$$

Therefore, formula is now $L = 3300 - 36 + 1400.95$

Step 2(d): Subtraction – moving from left to right. So, it is the 3,300 – first brackets of 36 = **3264**

Therefore, formula is now $L = 3264 + 1400.95$

Step 2(e): Addition. Last part is the **addition** of that 3,264 plus second brackets of 1400.95 = 4664.95

Step 3 To the nearest Pound.

4664.95 to the nearest pound.

ANSWER IS £4,665

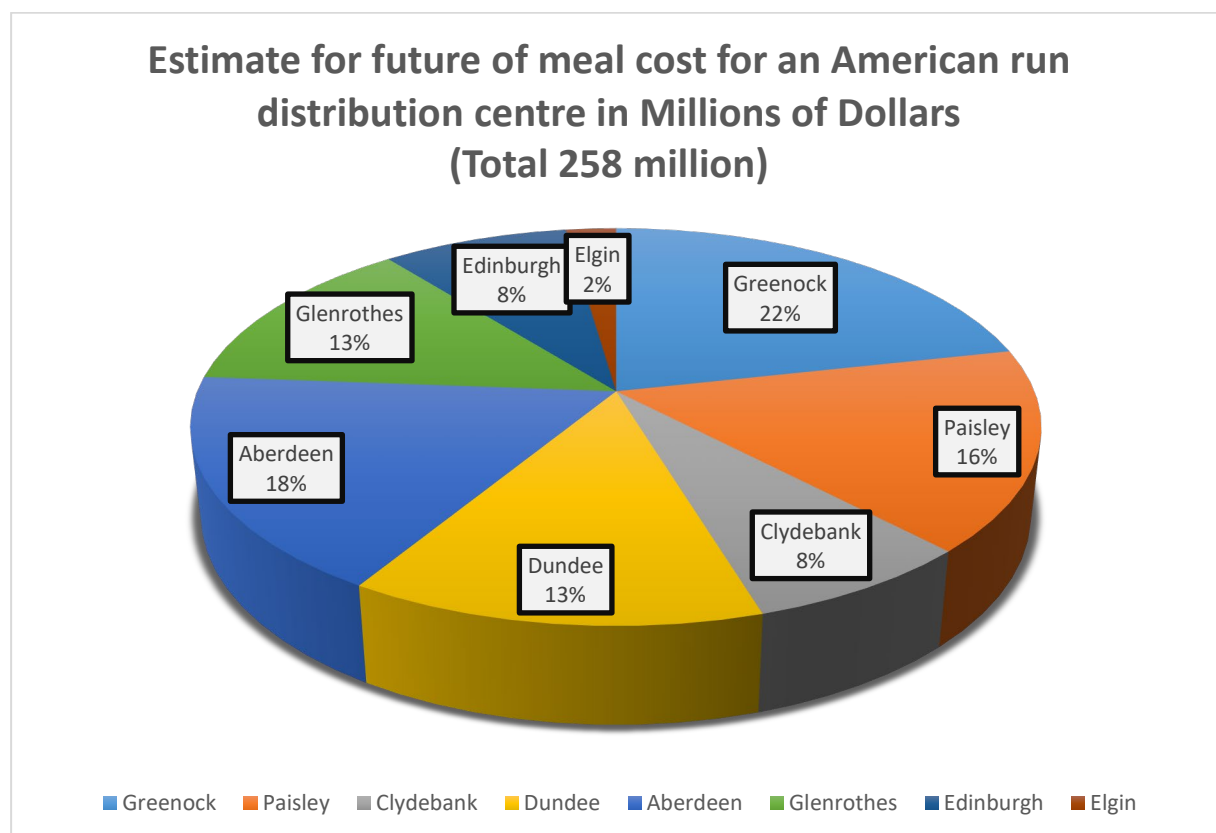
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QUESTION 7:

Interpret the pie chart below to create:

- (a) A table of results detailing the cost in Millions of US Dollars for each town to 2 decimal places (millions), for example, 2.54 million
- (b) A line graph showing the millions for each town in alphabetical order
- (c) A column chart showing the same data in same alphabetical order per town



**** fictional figures and not valid for any reason except this pre-assessment ****

ANSWER:

(use the following pages as displayed for answers)

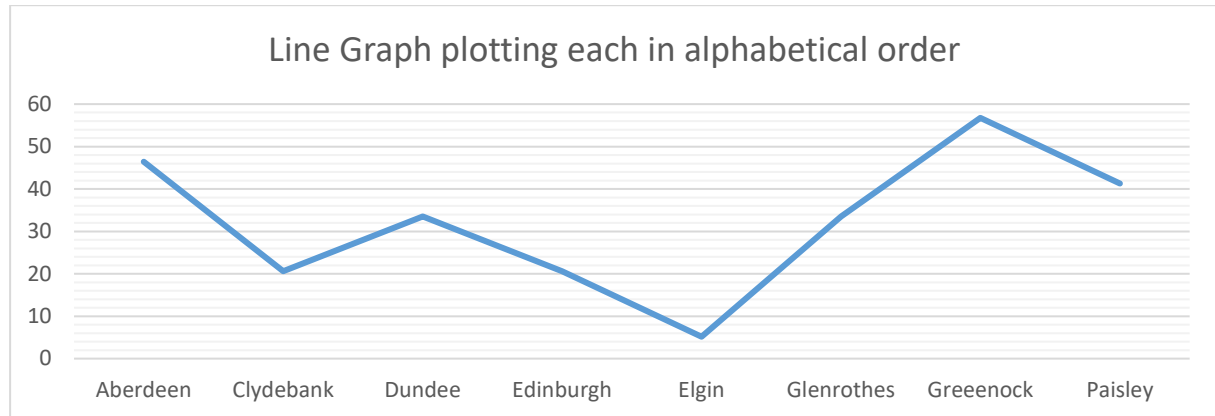
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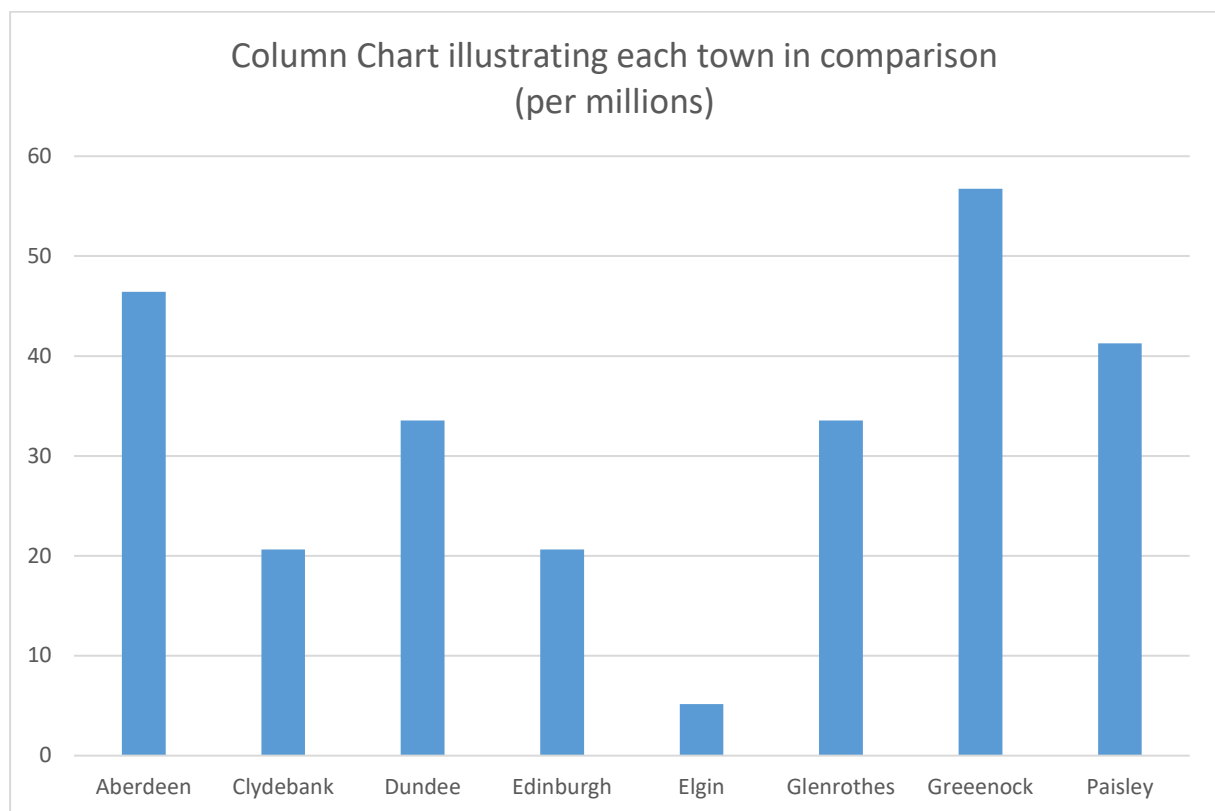
Table for 7(a)

Aberdeen	Dundee	Clydebank	Paisley	Greenock	Elgin	Edinburgh	Glenrothes
46.44	33.54	20.64	41.28	56.76	5.16	20.64	33.54

7(b) Line Graph plotting millions per town in alphabetical order



7(c) Column Chart with same data illustrated



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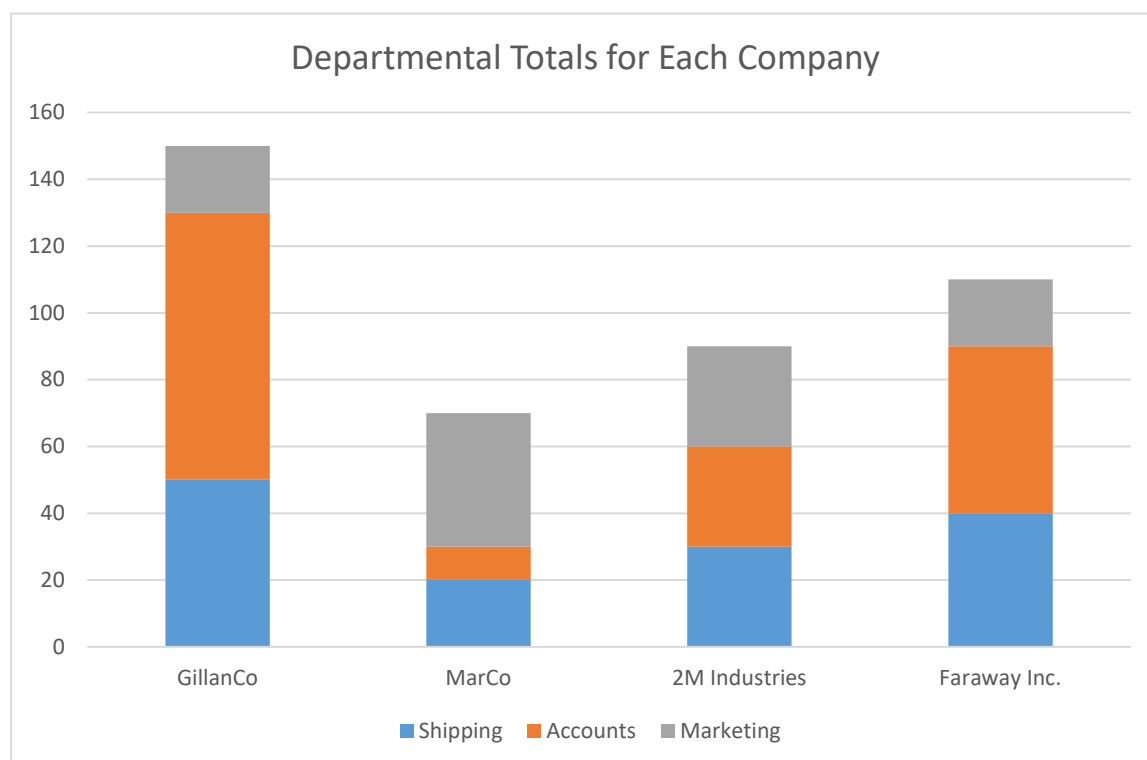
QUESTION 8:

Place the following data into an appropriate chart / graph showing how each department contributes to the overall total productivity for each company. Illustrate the contribution upon productivity for each department towards the total for each company.

Company per department

	Shipping	Accounts	Marketing
GillanCo	50	80	20
MarCo	20	10	40
2M Industries	30	30	30
Faraway Inc.	40	50	20

ANSWER:



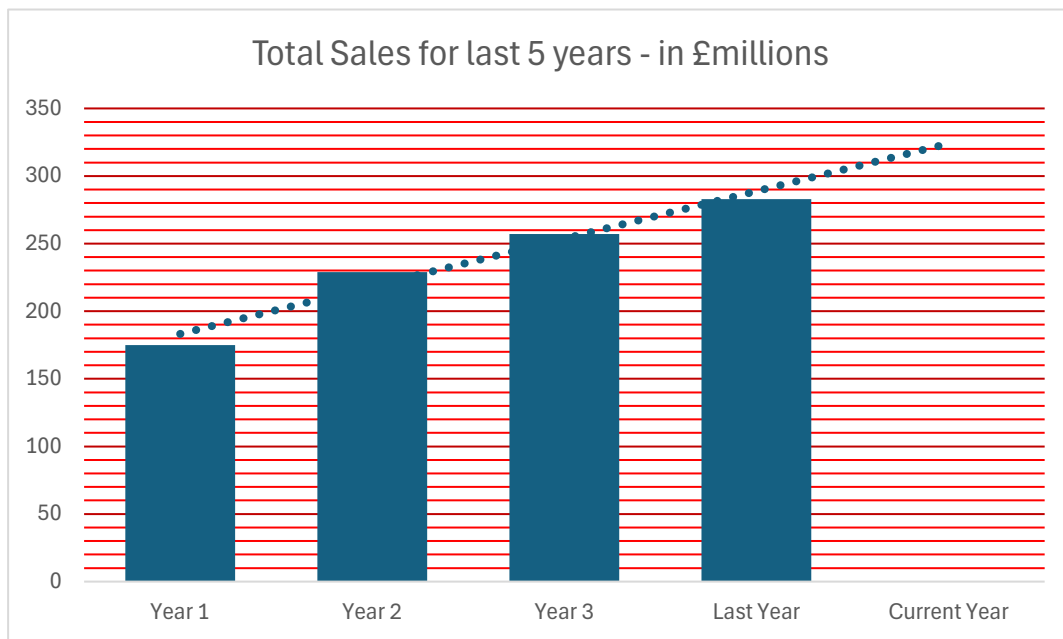
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QUESTION 9:

Gillan Supplies is a fast-growing company, operating internationally for the past five years.

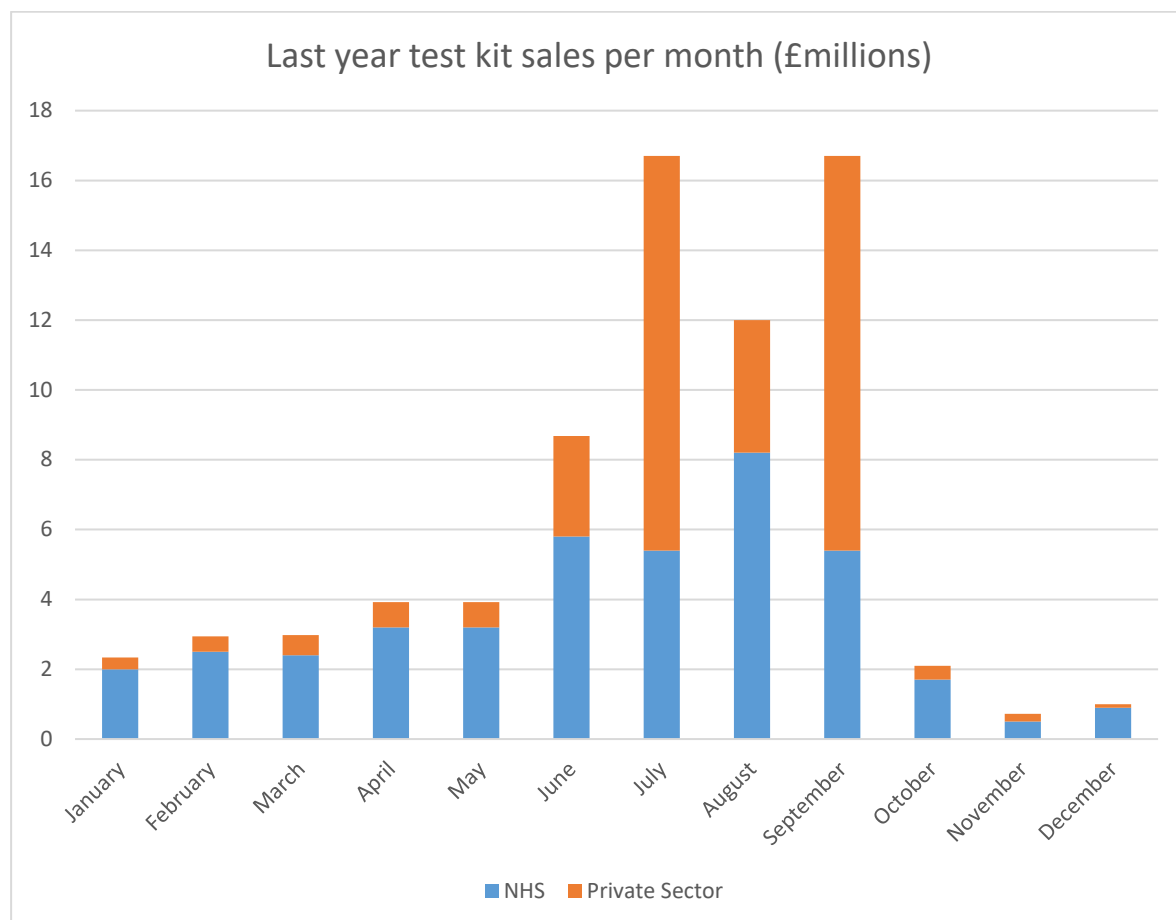
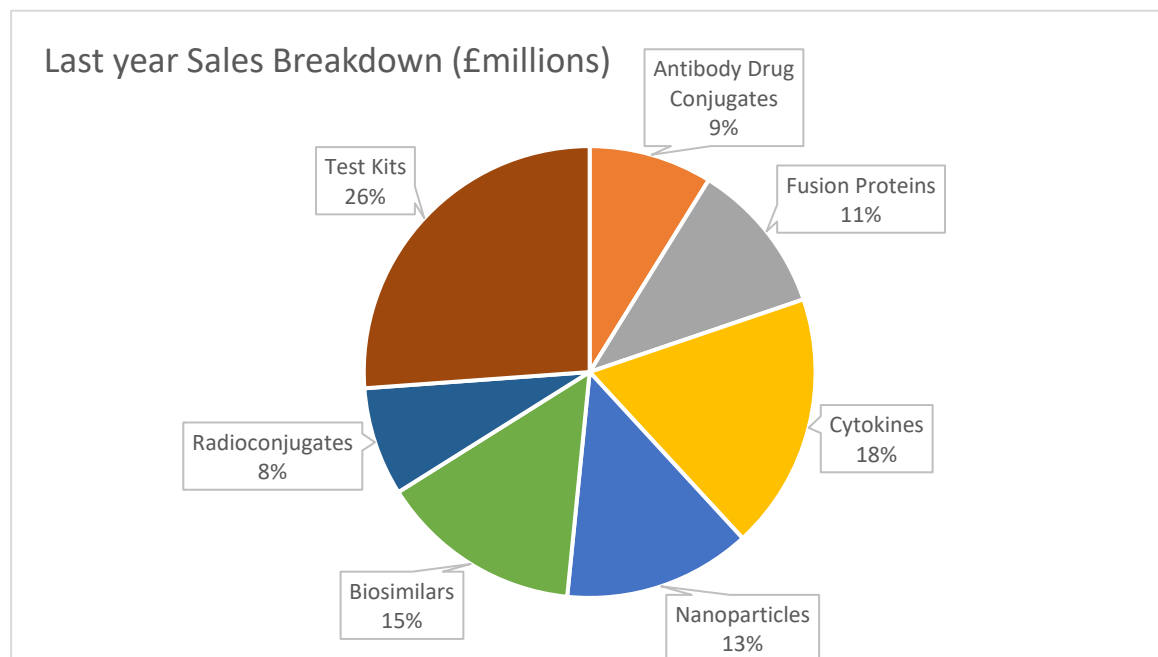
The charts below provide information on sales performance.



See next page for more charts and data...

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a) Estimate total sales in £millions for Last Year and justify your answer.

About 280 (just over) based upon minor horizontal lines for spaces between values

(Looking at the major line of 250 and counting up in 10's for each minor line)

b) Calculate the test kit sales for last year to 2 significant figures.

About 72.8 being percentage of the total last year (26% of 280 million estimate)
(Sales breakdown chart shows 26% for test kit sales last year x the total shown in the approximate total from question above being the total for all sales for last year of 280 million)

72.8 million is 3 significant figures, rounding off to about 73 million is 2 significant figures rather than typing all the zeros (not significant figures)

c) Last year, which month had the largest drop in test kit sales?

October.

(drop from September to October – therefore, October saw largest drop)

d) In which month(s) did Private Sector sales exceed NHS sales for test kits?

July and September

(The only months where the Private segment is greater than the NHS segment for each month – in colour, it would be the orange greater than the blue).

e) Based upon the increase between Total Sales between previous years and to Last Year, what would you predict as being the total for Current Year?

Justify your answer.

Increase between Year 1 and 2 is about 54, Year 2 to 3 is about 30 and more recent Year 3 to Last Year is about 30, going on the same increase between previous years, it would be at least an increase of between 30 and 54, so maybe about 320 or 325 for Current Year.

A trendline could be drawn as shown – use a ruler to roughly draw a line across each top of columns – straight line might be above or below some columns depending upon the chart / data used.

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QUESTION 10:

Alma had been earning £29,547 per annum last year.

Following a pay increase Alma is feeling happy to now be earning £33,102 per annum for this coming year.

What percentage increase did Alma receive to 2 decimal places?

ANSWER

$$\frac{\text{CHANGE or DIFFERENCE}}{\text{Divided by ORIGINAL AMOUNT}} \times 100$$

Change is the difference between £33,102 - £29,547 = 3,555

Therefore, change divided by the original multiplied by 100 to obtain percentage value:

$$3555 / 29547 = 0.1203167$$

x 100 and rounded off to 2 decimal places: **12.03%**

End of Pre-Assessment