Unit Title: Numeracy at SCQF Level 5
Unit Code: F3GF 11

Pre-assessment 2

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:

Mr Wong has an income of £51,950 and a tax free personal allowance of £12,750 as per a previous year of Scottish Tax Rate Bands in the table below.

How much income tax in total does Mr Wong have to pay for the financial year using the band rates provided below?

Show all workings and your answer to the nearest whole pound.

Bands	Band name	Rate (%)
Zero Rate upto £12,570	Personal Allowance	0
£12,571- £14,876	Starter Rate	19
£14,877 - £26,561	Scottish Basic Rate	20
£26,562 - £43,662	Intermediate Rate	21
£43,663 - £75,000	Higher Rate	42
£75,001 - £125,140	Advanced Rate	45
Above £125,140	Top Rate	48

ANSWER:

Scottish Income Tax Calculations 2024-25

Income Band	Income in Band	Income Tax
Personal Allowance	12,570.00	0
Starter Rate	2,306.00	438.14
Basic Rate	11,685.00	2,337.00
Intermediate Rate	17,101.00	3,591.21
Higher Rate	8,288.00	3,480.96
Advanced Rate	0.00	0.00
Top Rate	0.00	0.00
Total	**51,950.00**	**9,847.31**

- £2,306.00 @ 19% £438.14
- £11,685.00 @ 20% £2,337.00
- £17,101.00 @ 21% £3,591.21
- £8,288.00 @ 42% £3,480.96

Income Tax due £9,847.31

ANSWER: £9,847

QUESTION 2:

A large testing facility is considering changing gas supply for its burners. It uses 1920 units per month.

Gillan Energy is charging the following per month:

* 28.34 pence per unit for the first 750 units.
* 12.6 pence per unit for all units over 750.
* Standing monthly charge of £52.00
* VAT of 20 percent should be added to the final cost.

Nicol Fuels & Supplies is charging the following per month:

* 25.50 pence per unit for the first 1000 units.
* 9.01 pence per unit for the next 500 units.
* 3.2 pence per unit thereafter.
* Standing monthly charge of £49.50
* VAT of 20 percent should be added to the final cost.

What company is the cheapest and by how much?

ANSWER:

ANSWER ON NEXT PAGE...

Answer to Question 2

Gillan Energy

- **First 750 units** at 28.34 pence per unit:

$$750 \times 0.2834 = £212.55$$

- **Remaining units:**
$1920 - 750 = 1170$ units at 12.6 pence per unit:

$$1170 \times 0.126 = £147.42$$

- **Total cost before standing charge and VAT:**

$$£212.55 + £147.42 = £359.97$$

- **Standing charge:**

$$£52.00$$

- **Subtotal:**

$$£359.97 + £52.00 = £411.97$$

- **Add VAT (20%):**

$$£411.97 \times 1.20 = £494.36$$

Nicol Fuels & Supplies

- **First 1000 units** at 25.50 pence per unit:

$$1000 \times 0.255 = £255.00$$

- **Next 500 units** at 9.01 pence per unit:

$$500 \times 0.0901 = £45.05$$

- **Remaining units:**
$1920 - 1500 = 420$ units at 3.2 pence per unit:

$$420 \times 0.032 = £13.44$$

- **Total cost before standing charge and VAT:**

$$£255.00 + £45.05 + £13.44 = £313.49$$

- **Standing charge:**

$$£49.50$$

- **Subtotal:**

$$£313.49 + £49.50 = £362.99$$

- **Add VAT (20%):**

$$£362.99 \times 1.20 = £435.59$$

Final Comparison:

- **Gillan Energy** total cost: **£494.36**
- **Nicol Fuels & Supplies** total cost: **£435.59**

Conclusion:

- **Nicol Fuels & Supplies** is cheaper.
- The difference in cost is:

$$£494.36 - £435.59 = £58.77$$

ANSWER: Nicol Fuels & Supplies is £58.77 cheaper per month.

QUESTION 3:

A group of students completed a **mock test (out of 100 marks)** **BEFORE** and **AFTER** attending a study support session. Their scores are shown in the two **stem-and-leaf diagrams** below.

Before Revision Session

Stem (Tens)	Leaf (Units)
4	2 5
5	0 3 6 9
6	1 2 5 7 8
7	0 2
8	-

After Revision Session

Stem (Tens)	Leaf (Units)
5	3
6	1 4 5 8 9
7	0 2 4 6 8
8	1 2
9	0

Questions:

(a) How many students took the test before and after the revision session?
(b) What was the **highest** and **lowest** score in each test?
(c) Compare the **spread** of the data before and after. Which set has a **wider range**?
(d) Has performance generally improved after the revision session?
Justify your answer using the data.

ANSWER:

(a) Number of Students	
Before:	After:
• 2 + 4 + 5 + 2 = 13 students	• 1 + 5 + 5 + 2 + 1 = 14 students
(b) Highest and Lowest Scores	
Before:	After:
• **Lowest** = 42 • **Highest** = 72	• **Lowest** = 53 • **Highest** = 90
(c) Range (Spread of Scores)	
Before:	After:
• 72 − 42 = **30**	• 90 − 53 = **37**

(d) Interpretation of data:

Scores improved; Higher top score and higher minimum score

Although the range increased, it reflects overall improvement with a few higher achievers

QUESTION 4:

Ewa has been admitted to hospital and you are required to calculate Ewa's BMI using the formula:

$$\mathbf{BMI} = \frac{\mathbf{W}}{\mathbf{H^2}}$$

W is weight in Kilograms and H is height in metres.

Ewa weight 6 ½ stone and height is 4 ft 3 in.

(1 stone = 6.35 Kg, 1 inch = 2.54 cm, 1 foot = 12 inches)

a) What is Ewa's BMI correct to three significant figures?

ANSWER:

½ stone is 0.5 of 6.35 Kg = 3.175 Kg
6 stone x 6.35 Kg = 38.1 Kg
3.175 plus the 38.1 = a total weight of 41.275 Kg

4 ft x 12 = 48 inches plus the 3 inches totals ... 51 inches
51 inches x 2.54 = 129.54 cm

H x H ... 1.2954 x1.2954 = 1.6780

41.275 / 1.6780 = 24.5977354

Rounded off to BMI of 24.6

b) Using the categories below, determine which category Ewa falls into.

BMI Range:	Category:
Under 18	Underweight
Between 18 and 25.5	Healthy Weight
Between 25.5 and 33	Overweight
Between 33 and 44	Obese
Over 44	Extremely Obese

ANSWER: Ewa is a healthy weight.

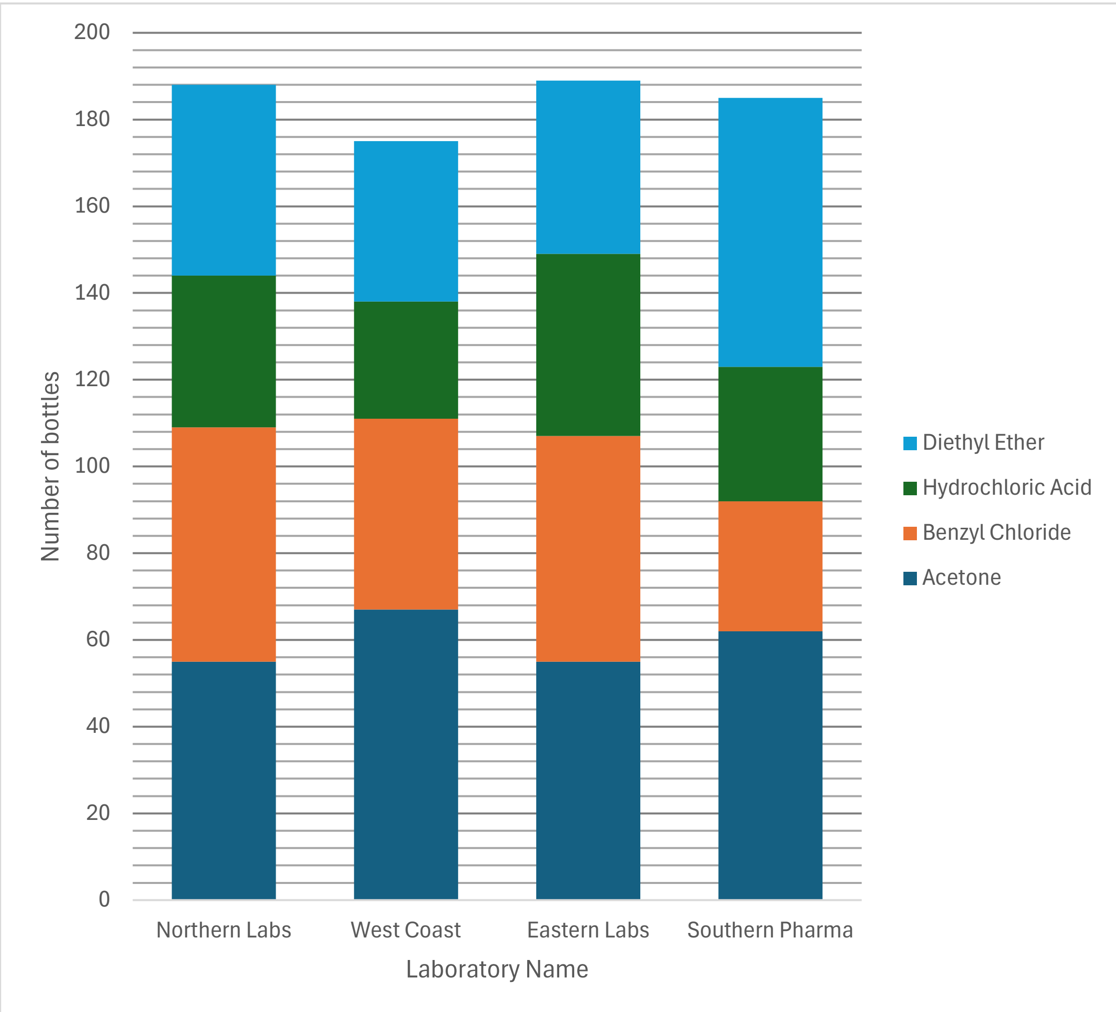
QUESTION 5:

The table below shows quantities of chemicals for three different products created by the name of laboratory head pharmacist.

Using an appropriate chart type, represent the information graphically to show the contribution of each chemical to the laboratory formula total.

	Bottles of Chemicals for each laboratory name.			
Laboratory	Acetone	Benzyl Chloride	Hydrochloric Acid	Diethyl Ether
Northern Labs	55	54	35	44
West Coast	67	44	27	37
Eastern Labs	55	52	42	40
Southern Pharma	62	30	31	62

ANSWER:



WEST COLLEGE SCOTLAND

QUESTION 6:

Head Pharmacist, Ms Patel has an income of £73,154 and a tax free personal allowance of £12,750 as per a previous year Scottish Tax Rate Bands in the table below.

How much income tax in total does Ms Patel have to pay for the financial year using the band rates provided below?

Show all workings and your answer to the nearest whole pound.

Bands	Band name	Rate (%)
Zero Rate upto £12,570	Personal Allowance	0
£12,571- £14,876	Starter Rate	19
£14,877 - £26,561	Scottish Basic Rate	20
£26,562 - £43,662	Intermediate Rate	21
£43,663 - £75,000	Higher Rate	42
£75,001 - £125,140	Advanced Rate	45
Above £125,140	Top Rate	48

ANSWER:

Income Band	Income in Band	Income Tax
Personal Allowance	12,570.00	0
Starter Rate	2,306.00	438.14
Basic Rate	11,685.00	2,337.00
Intermediate Rate	17,101.00	3,591.21
Higher Rate	29,492.00	12,386.64
Advanced Rate	0.00	0.00
Top Rate	0.00	0.00
Total	**73,154.00**	**18,752.99**

14,877-12571= 2306 x 0.19	438.14
26,562-14,877= 11,685 x 0.2	2,337.00
43,663-26,562 = 17101 x 0.21	3,591.21
Balance 29,492 29,492 x 0.42	12,386.64

ANSWER: £18,753

WEST COLLEGE SCOTLAND

QUESTION 7:

When purchasing utensils, you need to consider paying cash from one supplier or using credit facilities from another supplier.

You require to purchase 45 test tube kits of identical quality.

Gillan Pharma Supplies Company offers test tube kits at £547.99 each, plus 20% VAT. Cash discount of £50 off is available.

Nicol Dee Chem Plant offers the same test tube kits at Euros 723.55 each with no VAT payable and provides 10 months credit at 5% per annum calculated across the whole of the term of credit with the 10 month rate to 2 decimal places. You also benefit from keeping cash in the bank during this term, to the value of £100 as a gift from your bank.

Exchange rate equates to £1 being equivalent to 1.23 Euros.
Sterling should be used for all calculations.

a) Which supplier is cheaper?

b) How much do you save? Express this saving as a percentage rounded off to the nearest whole number percentage.

ANSWER:

Gillan Pharma Supplies Company:	Nicol Dee Chem Plant:
45 x 547.99 = £24,659.55 24,659.55 x 20% = £4,931.91	Euros 723.55 converted to Sterling is 723.55 / 1.23 = £588.25 £588.25 x 45 = £26,471.25
Cash discount of £50 off £24,659.55 + £4,931.91 = £29,591.46 - £50.00 = £29,541.46	5 percent divided by 12 months (per annum rate) multiplied by 10 = 4.17 % 26471.25 x 0.0417 = 1103.85 plus the original amount, less £100 = £27475.10
Total including VAT: £29,541.46	Total: £27,475.10

Gillan Pharma Supplies Company £29,541.46
- The cheaper Nicol Dee Chem Plant is £27,475.10
Answer to a) Saving of £2,066.36

Continued next page…

Compared to the higher amount of £29,541.46, it is a saving percentage of:

CHANGE or DIFFERENCE
Divided by
ORIGINAL AMOUNT
X 100

2,066.36 / 29,541.46 = 0.0699477954

x 100

Rounded off 7% saving compared to the more expensive supplier.

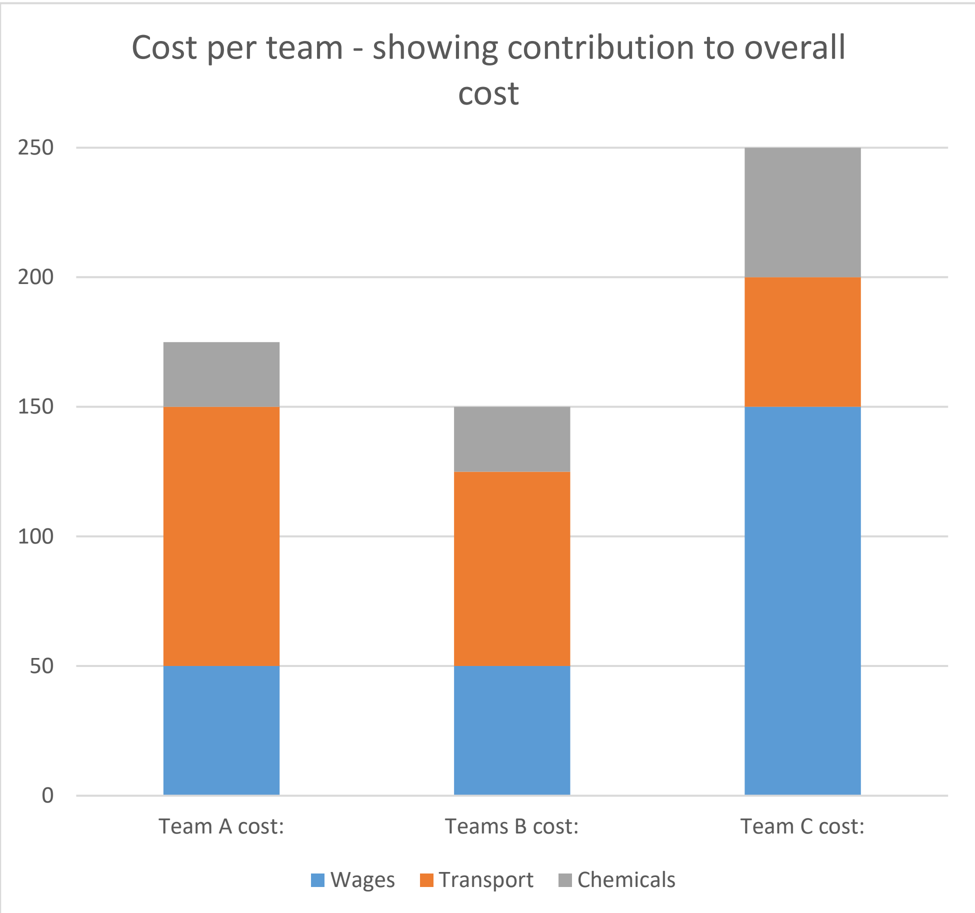
Answer to b) Nicol Dee Chem Plant is cheaper with a saving of 7%

QUESTION 8:

Display the table below in a chart to show how each cost relates to the overall budget.

	Team A cost:	Teams B cost:	Team C cost:
Wages	50	50	150
Transport	100	75	50
Chemicals	25	25	50

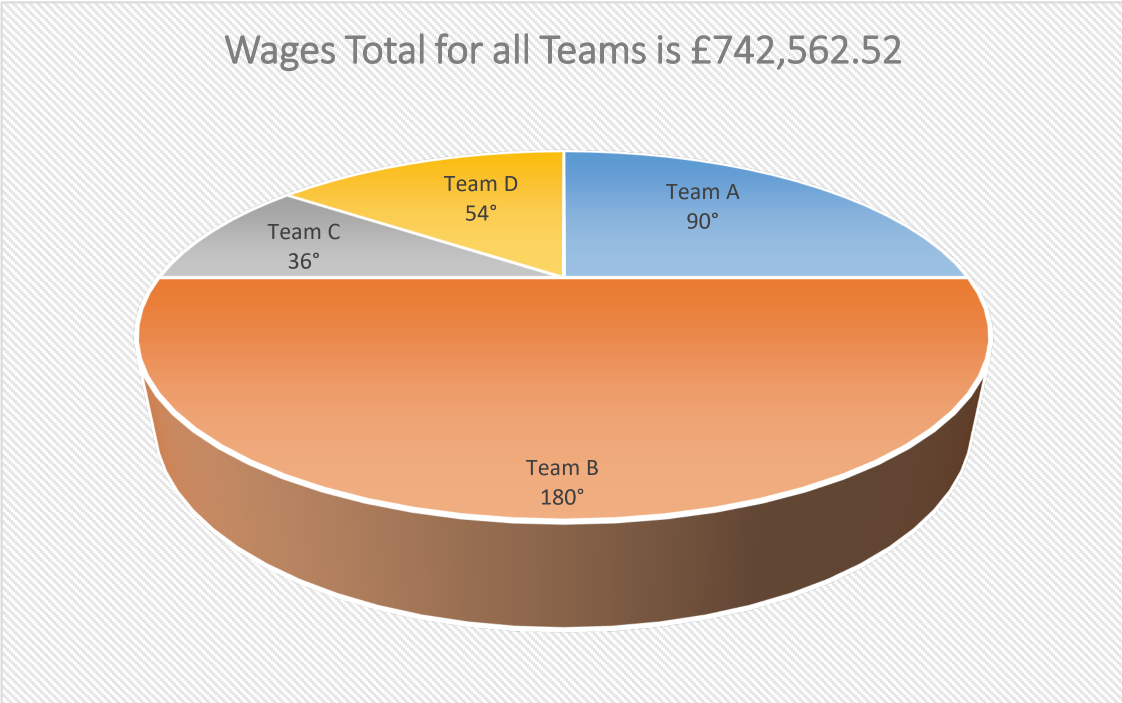
ANSWER:
Clustered Chart showing how each contributes to overall cost per team.



QUESTION 9:

Observing from the pie chart below, work out the wage bill for each team within Gillan Pharma Company, noting the total wage bill.

Place all the data into a table, listing all teams and the value associated with each team.



ANSWER:

TEAM:	Calculation:	PORTION:
Team A	90/360 = 0.25 (25%, ¼) Total £742,562.52x0.25 =	£185,640.63
Team B	180/360 = 0.5 (50%, half) Total x 0.5 =	£371,281.26
Team C	36/360 = 0.1 (10%) Total x 0.1 =	£74,256.25
Team D	54/360 = 0.15 (15%) Total x 0.15 =	£111,384.38

QUESTION 10:

You receive an electricity charge and need to calculate the cost of electricity as follows:

Electricity Standing Charge is	£38.45
Your current electricity reading is	12809
Your previous electricity reading was	11714

Unit charge is 8.3p for each unit used.

Tax is then levied on top of the above calculation at a rate of 20%

What is the total Electricity bill? Please show all your calculations, rounding off to 2 d.p. currency.

ANSWER:

Units used: 12809 – 11714 = 1095

1095 x 0.083 = £90.89 Plus standing charge of £38.45 = £129.34

129.34 x 0.20 VAT = 25.87 rounded off and added on...

£129.29 + £25.87 = £155.21

Answer: £155.21

End of Pre-Assessment