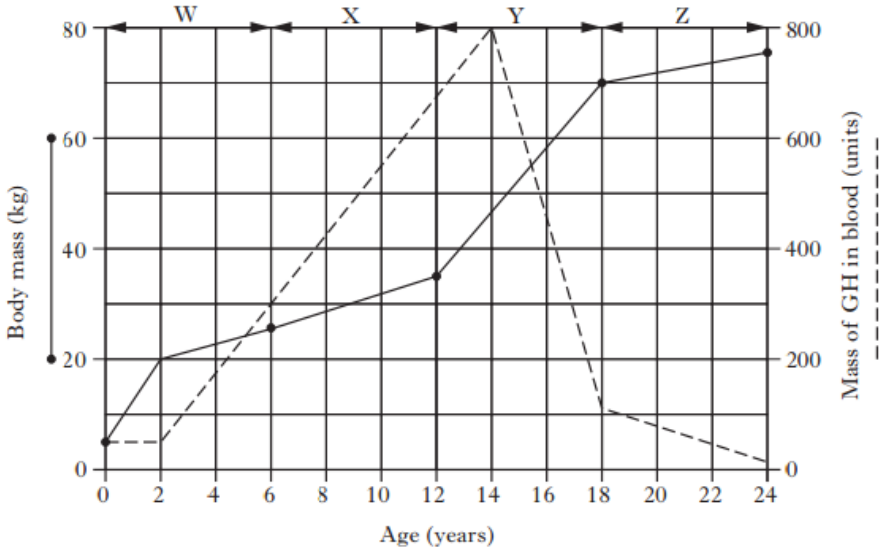
Key Area 2.2 - Homework 3

1. The graph below shows the changes in body mass and mass of growth hormone (GH) in the blood of a human from birth to age 24 years.



(i) Tick (✔) the box to show the age range during which the most rapid increase in body mass occurred. S1

0–2 years ☐ 2–12 years ☐ 12–18 years ☐ 18–24 years ☐

(ii) An **increase** in growth hormone (GH) causes an **increase** in mass of muscle and bone tissues.
Tick (✔) the box to show the region of the graph which best supports this statement. S1

W ☐ X ☐ Y ☐ Z ☐

2. Which line in the table below identifies correctly the hormones which stimulate the conversion of glucose and glycogen? KU1

	glycogen → glucose	*glucose → glycogen*
A	glucagon and	insulin
B	adrenalin	glucagon and insulin
C	insulin	glucagon
D	glucagon and insulin	adrenalin

3. Which of the following shows the correct responses to changes in blood sugar concentration? KU1

	Sugar concentration in blood	*Glucagon secretion*	*Insulin secretion*	*Glycogen stored in liver*
A	increases	decreases	increases	increases
B	increases	decreases	increases	decreases
C	decreases	increases	decreases	increases
D	decreases	decreases	increases	decreases

4. At the start of an investigation, the blood glucose and insulin concentrations of a healthy adult human were measured and found to be normal. The individual then immediately drank a glucose drink and his blood glucose and insulin levels were re measured at intervals over a period of 5 hours without further food or drink intake. The results are shown in the table below

Time after glucose drink was taken (hours)	*Glucose concentration* (mg per 100 cm^3)	*Insulin concentration* (units)
0 (start)	80	50
0·5	90	550
1	120	500
2	100	400
3	80	100
4	80	50
5	70	45

(a) Calculate the simplest whole number ratio of blood glucose concentration at the start to the maximum level recorded.

Space for calculation

_____at start : _____at maximum level PRO1

(b) Calculate how long it took for blood insulin concentration to return to the start level from its maximum concentration.

Space for calculation

_____ hours PRO1

(c) Give two reasons to account for the decrease in blood glucose concentration between 1 and 3 hours.

1 _____ KU1
2_____ KU1

(d) Predict how the individual's blood glucagon concentration will change after 5 hours assuming **no further intake of food or drink**.

Explain the importance of this.

Prediction_____ PRE1

Explanation_____ A1