

# Unit 1 - Chapter 10 Graded Process Problems [12 marks]

Name \_\_\_\_\_

Full marks are not necessarily awarded for a correct answer with no working. Answers must be supported by working and/or explanations. In particular, solutions found from a graphic display calculator should be supported by suitable working, for example if graphs are used to find a solution, you should sketch these as part of your answer. Where an answer is incorrect, some marks may be given for a correct method, provided this is shown by written working. You are therefore advised to show all working.

The following table shows the average weights ( $y$  kg) for given heights ( $x$  cm) in a population of men.

<b>Heights (<math>x</math> cm)</b>	165	170	175	180	185
<b>Weights (<math>y</math> kg)</b>	67.8	70.0	72.7	75.5	77.2

- 1a. The relationship between the variables is modelled by the regression equation  $y = ax + b$ . [2 marks]  
Write down the value of  $a$  and of  $b$ .
- 1b. The relationship between the variables is modelled by the regression equation  $y = ax + b$ . [2 marks]  
Hence, estimate the weight of a man whose height is 172 cm.
- 1c. Write down the correlation coefficient. [1 mark]
- 1d. State which **two** of the following describe the correlation between the variables. [2 marks]  
strong      zero                  positive  
negative    no correlation    weak

The following table shows the amount of fuel ( $y$  litres) used by a car to travel certain distances ( $x$  km).

<b>Distance (<math>x</math> km)</b>	40	75	120	150	195
<b>Amount of fuel (<math>y</math> litres)</b>	3.6	6.5	9.9	13.1	16.2

This data can be modelled by the regression line with equation  $y = ax + b$ .

- 2a. Write down the value of  $a$  and of  $b$ . [2 marks]
- 2b. Explain what the gradient  $a$  represents. [1 mark]
- 2c. Use the model to estimate the amount of fuel the car would use if it is driven 110 km. [2 marks]

