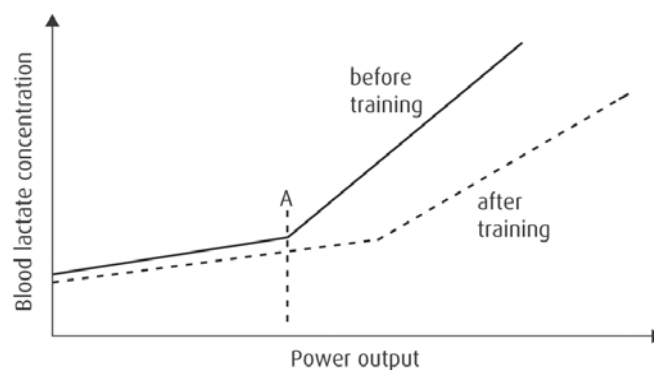


Support worksheet – Option B

- 1** The table below compares an elite athlete and an untrained person who have both run a 200 m distance.

	Athlete	Untrained person
Pulse rate / min⁻¹	90	120
Stroke volume / cm³	109	112
Cardiac output / dm³ min⁻¹		13.44

- a** Describe how a pulse rate measurement would be taken. (1)
- b** Outline how a pulse is produced. (2)
- c** Define ‘stroke volume’. (1)
- d** Define ‘cardiac output’. (1)
- e** Calculate the cardiac output of the athlete. (2)
- f** What are the main reasons for the differences between the two runners? (3)
- 2** Compare the structural differences between fast-twitch and slow-twitch muscle fibres and suggest how these differences make them well adapted to their functions and methods of generating ATP. (5)
- 3** Training affects a person’s ability to process lactate and also their ability to perform. A rower undertook a three-week programme of aerobic training and the graph shows the concentration of lactate in his blood and his power output before and after training.



- a** Describe and suggest a reason for the relationship between the blood lactate concentration and intensity of exercise (power output) up to point A on the graph. (2)
- b** Which organ in the body processes lactate from the blood? (1)
- c** After training the level of blood lactate remains low for higher power outputs. Suggest three physiological changes that might have occurred to contribute to this effect. (3)