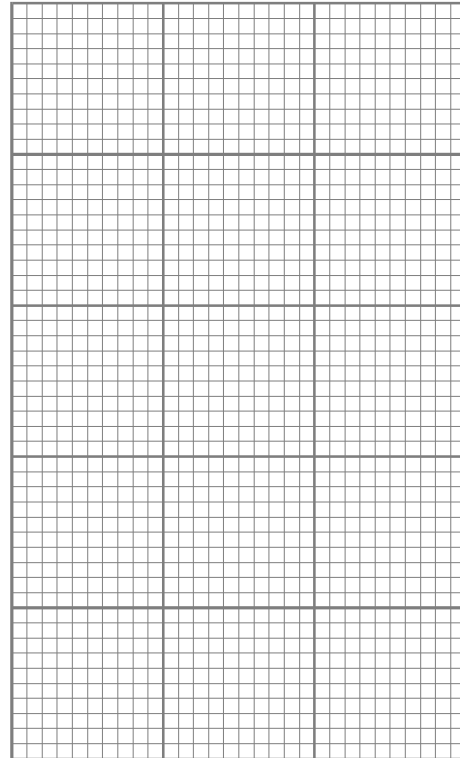


Anaerobic respiration

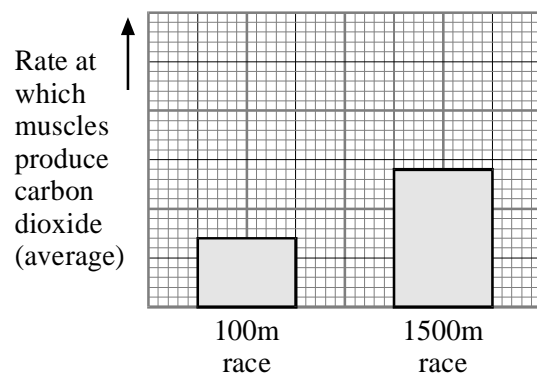
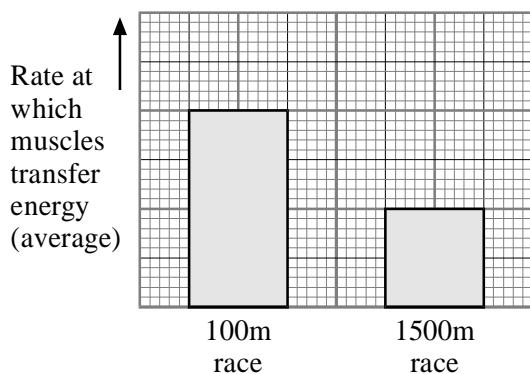
1. (a) The table shows an athlete's breathing rate after the end of a race.
Use the information shown in the table to draw a line graph.

Time after end of race (minutes)	Breathing rate (litres per second)
0	4
1	2
2	1
3	1
4	1
5	1



(3)

- (b) The bar charts show what happens in an athlete's muscles when running in two races of different distances.



- (i) Compare what happens in the athlete's muscles when running in the two races.

.....

(3)

(ii) Use the information in the box to explain your answer to (i).

aerobic respiration	glucose + oxygen → carbon dioxide + water
anaerobic respiration	glucose → lactic acid

.....
.....

(2)

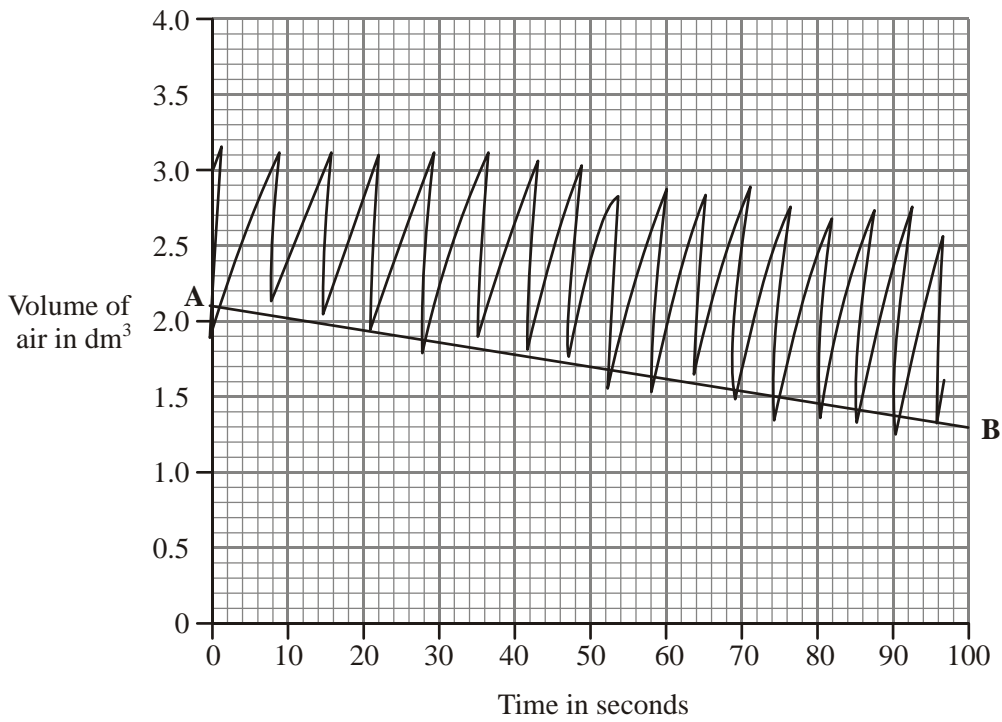
(c) Explain why the athlete breathes at a faster rate than normal for two minutes after finishing a 100 metres race.

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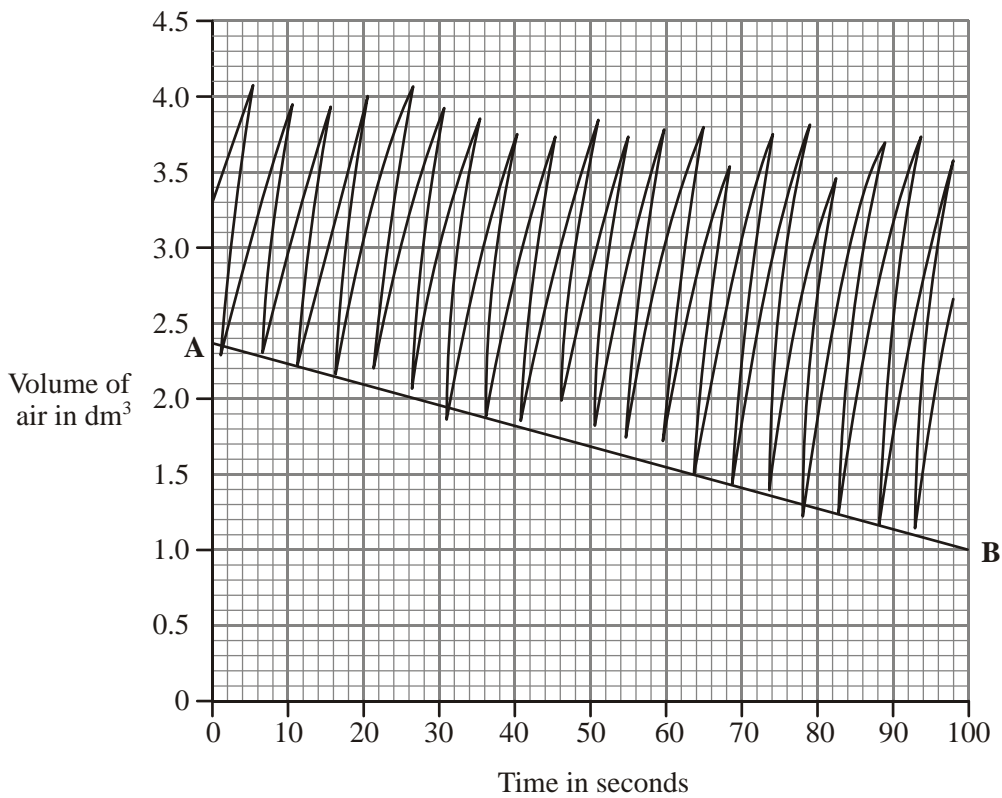
(2)

(Total 10 marks)

2. A student's breathing was monitored before and after vigorous exercise. The student breathed in and out through a special apparatus. The graphs show the changes in the volume of air inside the apparatus. Each time the student breathed in, the line on the graph dropped. Each time the student breathed out, the line went up.



Before exercise



After exercise

(a) How many times did the student breathe in per minute:
before exercise;
after exercise? (1)

(b) On each graph, the line **A – B** shows how much oxygen was used. The rate of oxygen use before exercise was 0.5 dm^3 per minute. Calculate the rate of oxygen use after exercise.
.....
.....
.....
Rate of oxygen use after exercise = dm^3 per minute (2)

(c) The breathing rate and the amount of oxygen used were still higher after exercise, even though the student sat down to rest. Why were they still higher?
.....
.....
.....
.....
.....
.....
.....
..... (4)

(Total 7 marks)