Question 12 **(6 marks)**

Part of Josie's workout at her gym involves a 10 minute run on a treadmill. The treadmill's program makes her run at a constant 12.3 km/h for the first 2 minutes and then her speed, $s(t)$, is determined by the equation below, where t is the time in minutes after she began running.

$$s(t) = 10 - \frac{\ln(t - 1.99)}{t} \text{ km/h}$$

(a) Sketch the graph of her speed during this run versus time on the axes below. (3 marks)

(b) At what time(s) is Josie's speed 10 km/h? (1 mark)

(c) At what time(s) during her run is Josie's acceleration zero? (2 marks)