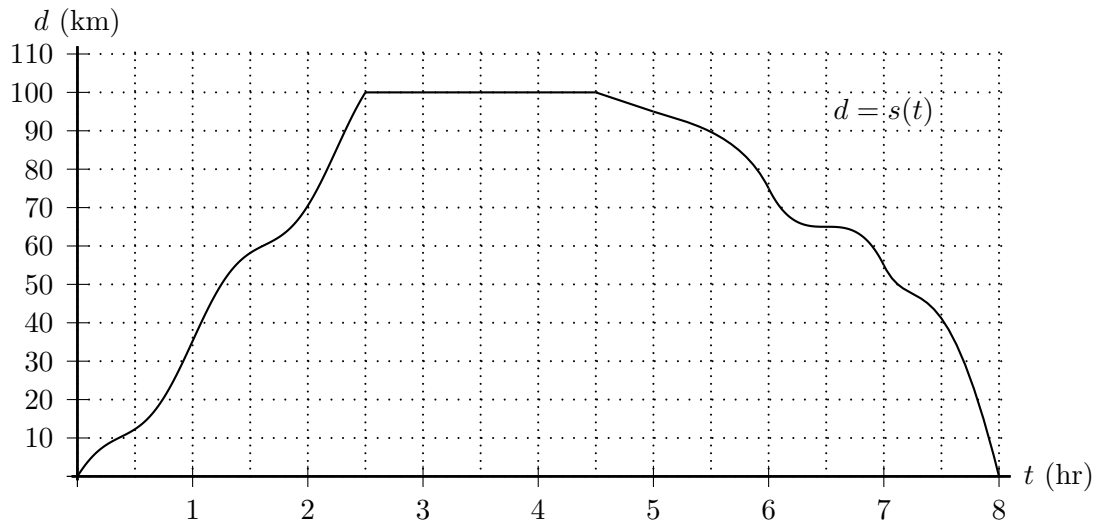


3. [8 points] A ship's captain is making a round trip voyage between two ports. The ship sets sail from Port Jackson at noon, arrives at Port Kembla some time later, waits there for a while, and then returns to Port Jackson. Let  $s(t)$  be the ship's distance, in kilometers, from its starting point of Port Jackson,  $t$  hours after noon. A graph of  $d = s(t)$  is shown below.



Remember to include units where appropriate.

- a. [1 point] How far is Port Kembla from Port Jackson?

Answer: 100 kilometers

- b. [1 point] How long does the ship wait in Port Kembla?

Answer: 2 hours

- c. [1 point] Sometime after 5 PM, there is a time when the ship's instantaneous velocity is 0 km/hr. At what time does this occur?

Answer: 6:30 PM

- d. [2 points] What is the ship's average speed during the return trip from Port Kembla to Port Jackson?

Answer:  $100/3.5 \approx 28.6$  km/hr

- e. [3 points] Estimate the ship's instantaneous velocity at 1 PM.

Answer: 65 km/hr