

Homework 1

1. At age 3, little Joey was 3 feet tall. By age 5, he had grown to 3 feet, 5 inches.
 - (a) Assuming linear growth, how tall do you expect Joey to be at age 8?

 - (b) Write an approximate linear formula for Joey's expected height at age x .

 - (c) Use the Internet to find a pediatric growth chart for boys in the United States, ages 2 to 20. Print out the chart, and graph the line you found in part (b) on top of it. **Attach the result to your homework.**

 - (d) Based on your graph from part (c), for what range of ages is the linear approximation you found in part (b) likely to be accurate? Explain.

2. At 12:00 noon, a boat departs from an island and sails north with a speed of 20 km/h. At the same time, a second boat is 30 km due east of the island, and is sailing west at a speed of 15 km/h.
- (a) Draw a picture showing the locations of the two boats at 1:00 pm. Make sure to indicate the distance from each boat to the island.

(b) How far apart are the two boats at 1:00 pm?

(c) How far apart will the two boats be at 1:30 pm?

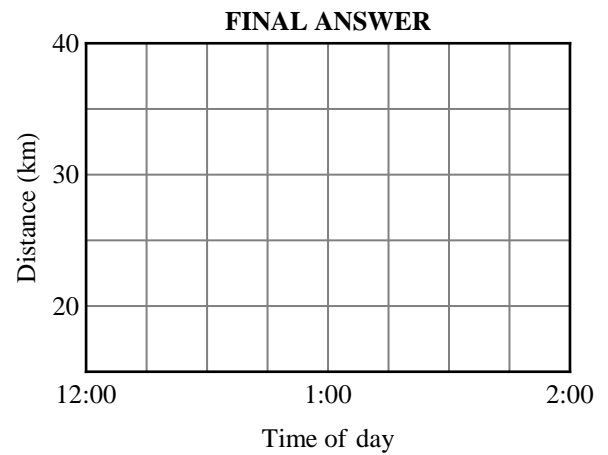
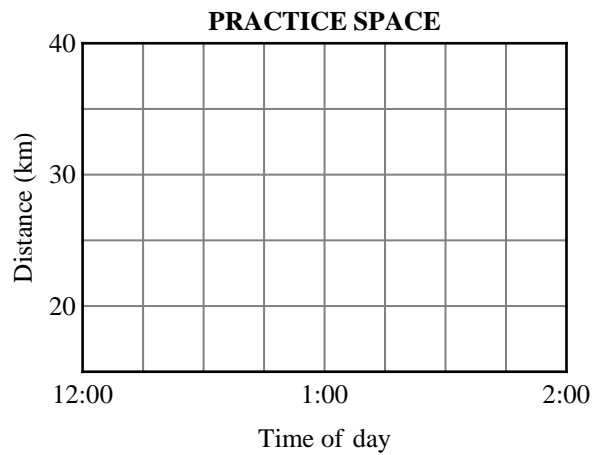
Let t be the time in hours since 12:00 noon.

(d) Find a formula for the distance from the first boat to the island at time t .

(e) Find a formula for the distance from the second boat to the island at time t .

(f) Use your answers to parts (d) and (e) to find a formula for the distance between the two boats at time t . Make sure that your formula agrees with your answers to parts (b) and (c)

- (g) Use the following axes to draw a careful graph of the distance between the two boats. Feel free to use a graphing calculator or computer to help you with this part.



- (h) Using a graphing calculator or computer, determine the time at which the two boats are closest together. Your answer should be correct to the nearest minute (e.g. 1:17 pm).

- (i) For what times is the distance between the two boats decreasing? For what times is the distance increasing?