# Graphing Data

Graph the data for the following scenarios and answer the questions that follow.

1. A boy does pushups for five minutes. The number of pushups he has completed after every thirty seconds of the five-minute period is contained below. Make a graph showing the number of pushups he was able to complete during the five-minute period.

Time (minutes)	Number of Pushups
0.0	0
0.5	20
1.0	32
1.5	42
2.0	50
2.5	56
3.0	60
3.5	64
4.0	66
4.5	66
5.0	68
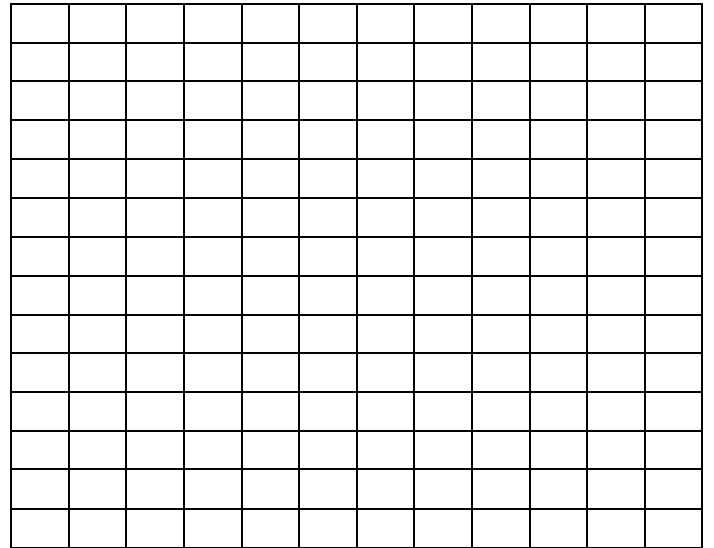
a. When is the boy doing the most pushups per minute?

b. Approximately how long does it take the boy to complete 52 pushups?

c. Explain why the rate of pushups per minute would decrease as time increased.

d. What does every point on the line represent?

e. Give a reason why the rate would significantly decrease towards the end of the five-minutes?

2. Robin, roller-skating down a marked sidewalk, was observed to be at the following positions at the times listed below:

t (s)	x (m)
0.0	10.0
1.0	12.0
2.0	14.0
5.0	20.0
8.0	26.0
10.0	30.0

x (m) / t (s)
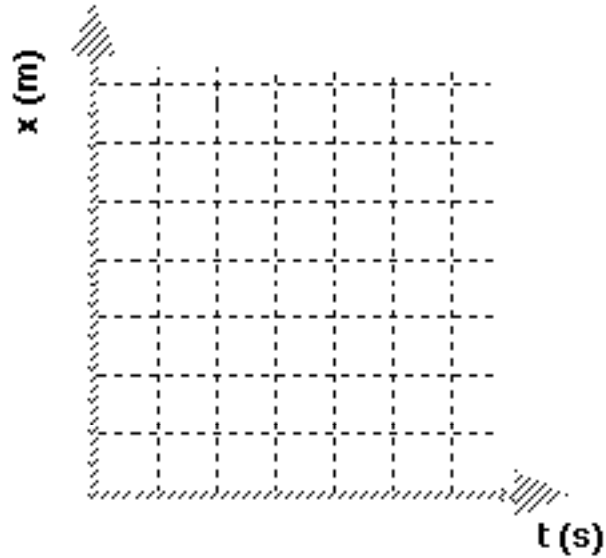
a.   Plot a position vs. time graph for the skater.

b.   How far from the starting point was he at t = 6s? How do you know?

c.   What is the slope of the curve? What are the units for the slope?

d.   Write a mathematical model (equation) to describe the curve in (a).

e.   Was his speed constant over the entire interval? How do you know?

3.   The following data were obtained for a second trial:

t (s)	x (m)
0.0	4.0
2.0	10.0
4.0	16.0
6.0	22.0
8.0	28.0
10.0	34.0
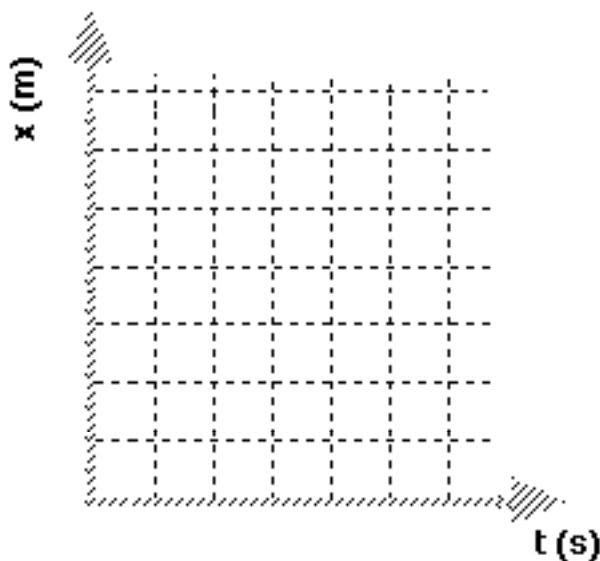
x (m)

t (s)

a.   Plot the position vs. time graph for the skater.

b.   What is the slope of the curve? What are the units for the slope?

c.   How far from the starting point was he at t = 5s? How do you know?

d.   Was his speed constant? If so, what was it?

e.   In the first trial the skater was further along at 2s than he was in the second trial. Does this mean that he was going faster? Explain your answer.

4.   Suppose now that our skater was observed in a third trial. The following data were obtained:

t (s)	x (m)
0.0	0.0
2.0	6.0
4.0	12.0
6.0	12.0
8.0	8.0
10.0	4.0
12.0	0.0
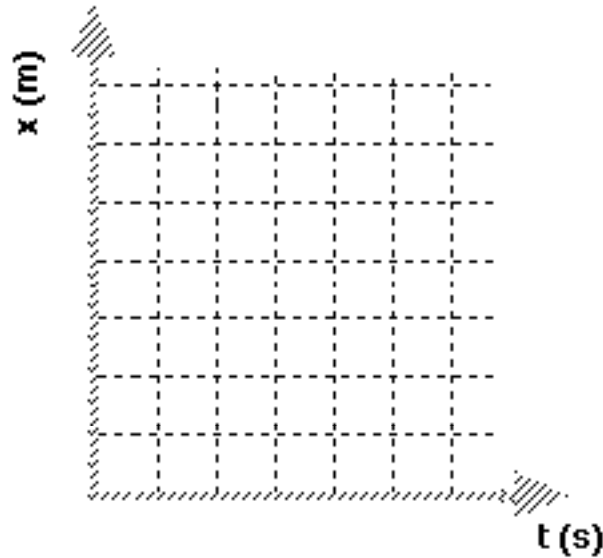
a.   Plot the position vs. time graph for the skater.

b.   What do you think is happening during the time interval: t = 4s to t = 6s? How do you know?

c.   What do you think is happening during the time interval: t = 6s to t = 12s? How do you know?

d.   Determine the skater's average **speed** from t = 0s to t = 12s.

e.   Determine the skater's average **velocity** from t = 0s to t = 12s.