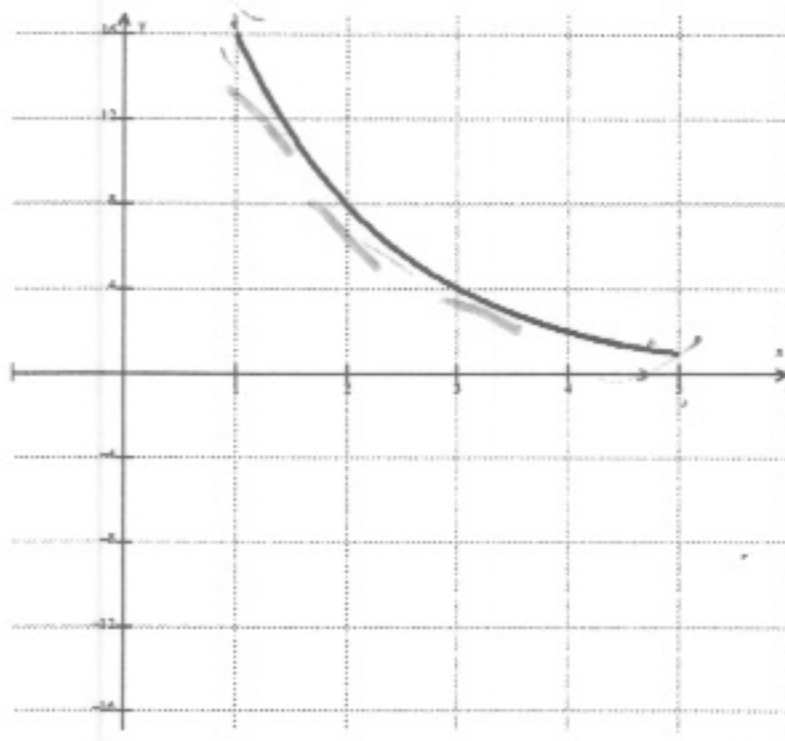


Velocity, Speed, and Acceleration

Situation 3

time	velocity	speed
1	16	16
2	8	8
3	4	4
4	2	2
5	1	1



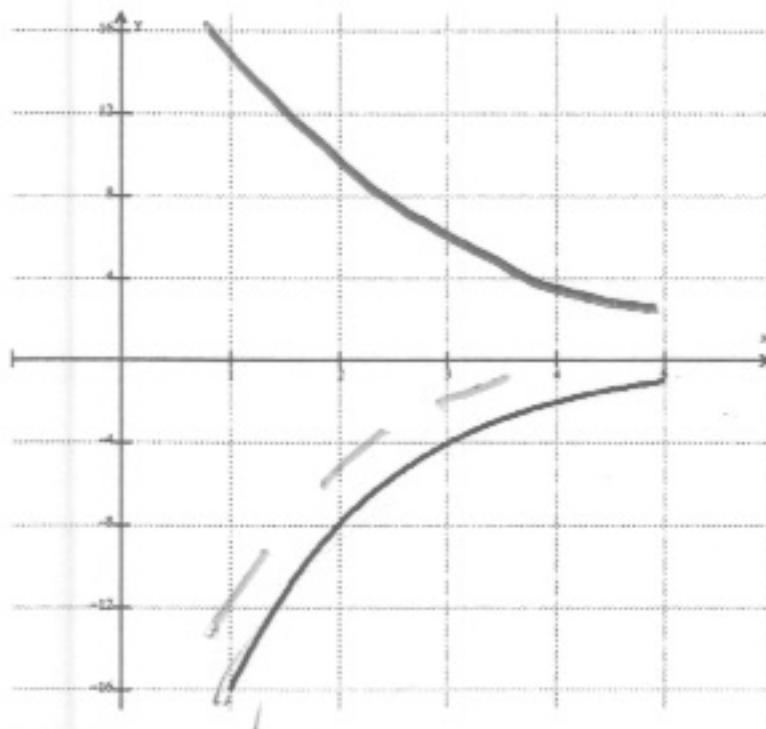
In this situation, the velocity is pos. (pos. or neg.) and decr. (incr. or decr.)

Because the velocity is decr (incr. or decr.), the acceleration must be neg (pos. or neg.).

By examining the graph of speed and the table of values, we can conclude that speed is decr (incr. or decr.)

Situation 4

time	velocity	speed
1	-16	16
2	-8	8
3	-4	4
4	-2	2
5	-1	1



In this situation, the velocity is neg (pos. or neg.) and incr (incr. or decr.)

Because the velocity is incr (incr. or decr.), the acceleration must be positive (pos. or neg.).

By examining the graph of speed and the table of values, we can conclude that speed is decreasing (incr. or decr.)

Conclusions

In which situations was the *speed increasing*?

When the speed is increasing, the velocity and acceleration have same (same/opposite) signs.

In which situations was the *speed decreasing*?

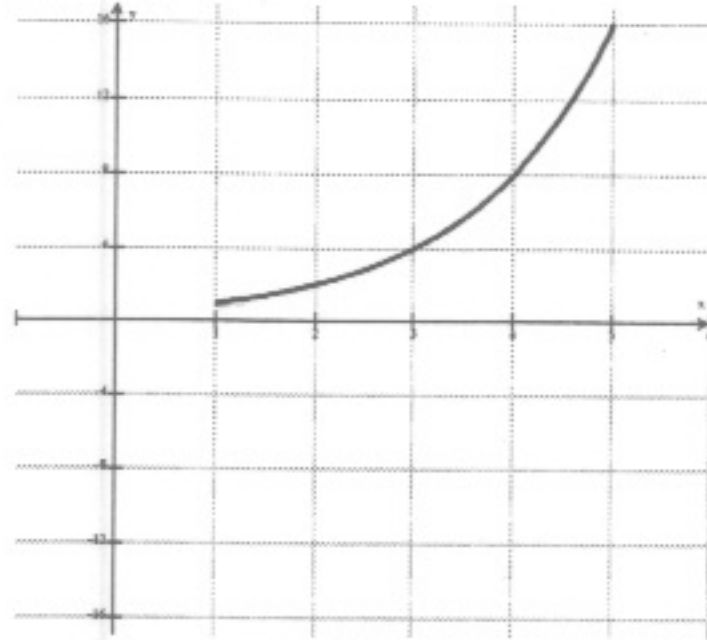
When the speed is decreasing, the velocity and acceleration have opposite (same/opposite) signs.

Velocity, Speed, and Acceleration

There are 4 "situations" below. Each one contains the graph of a differentiable function giving velocity as a function of time t for $1 \leq t \leq 5$ and selected values of the velocity function in a table. For each situation, plot the speed graph on the same coordinate plane as the velocity graph and fill in the speed values in the table. Then, answer the questions that follow based on the graph and table of values. Recall that speed is the absolute value of velocity.

Situation 1

time	velocity	speed
1	1	1
2	2	2
3	4	4
4	8	8
5	16	16



$v(t)$

y-values count by 4
x-values count by 1

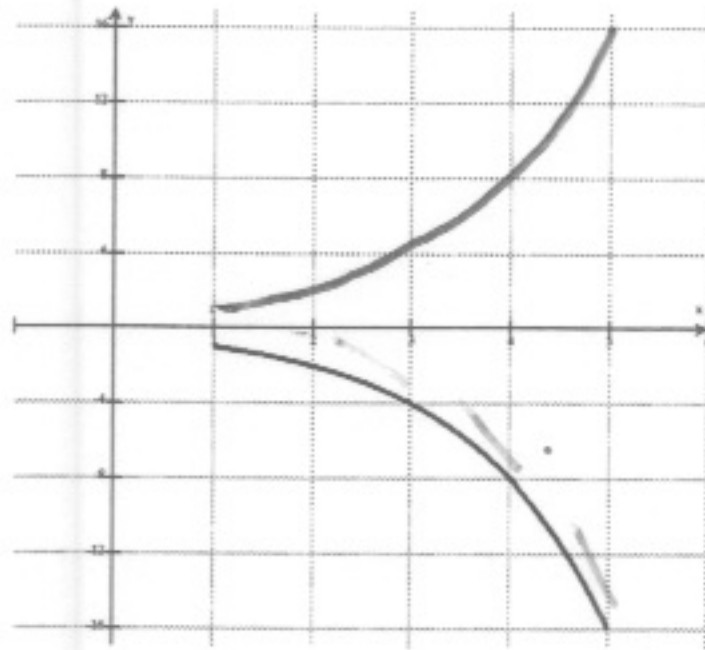
In this situation, the velocity is pos (pos. or neg.) and incr (incr. or decr.)

Because the velocity is incr (incr. or decr.), the acceleration must be pos (pos. or neg.).

By examining the graph of speed and the table of values, we can conclude that speed is incr (incr. or decr.)

Situation 2

time	velocity	speed
1	-1	1
2	-2	2
3	-4	4
4	-8	8
5	-16	16



In this situation, the velocity is neg (pos. or neg.) and decr (incr. or decr.)

Because the velocity is decr (incr. or decr.), the acceleration must be neg (pos. or neg.).

By examining the graph of speed and the table of values, we can conclude that speed is incr (incr. or decr.)

Velocity, Speed, and Acceleration

Questions

1. If velocity is negative and acceleration is positive, then speed is decreasing.
2. If velocity is positive and speed is decreasing, then acceleration is neg..
3. If velocity is positive and decreasing, then speed is decrease.
4. If speed is increasing and acceleration is negative, the velocity is (positive/negative) and (increasing/decreasing).
5. If velocity is negative and increasing, the speed is decreasing.
6. If the particle is moving to the left and speed is decreasing, the acceleration is positive.
7. If the graph of the velocity is moving away from the time axis, then speed is increase.
8. If the speed is decreasing and velocity is negative, then is the velocity increasing or decreasing?
9. If the speed is decreasing and acceleration is negative, the velocity is (positive/negative) and (increasing/decreasing).