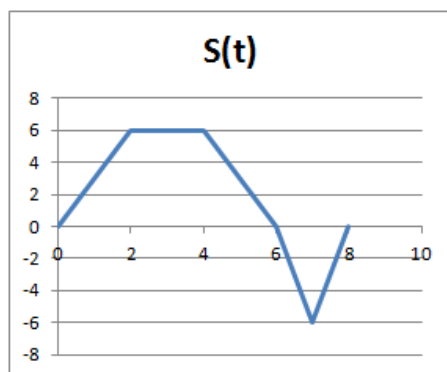# MATH 101-QUIZ 3

Q (1-3). The **position**, S in kilometers, of a car moving along a straight road is described with respect to time, t in minutes, by the following graph.

1. When did the car move backward?

2. When was the car stopping for a red traffic light?

3. How far did the car travel during this eight minutes?

Hint: Graph the velocity.

Q 4. Let
$$g(x) = \frac{2x\sqrt{x}}{f(x)},$$
where given $f(4) = 1$, and $f'(4) = -1$. Then differentiating the function, g, leads to $g'(4) =$?

Q 5. Find the following limit, if it exists.
$$\lim_{x \to 0} \frac{(3x^2 - 1)(2x + 1)e^{5x} + 1}{x} =?$$

Q (6-7): A rock thrown vertically upward from the surface of the moon. Its position from the surface, $S(t)$ in meters after t seconds, is modeled as follows

$$S(t) = at - 0.8t^2,$$

where a is unknown.
(6) If the rock hits the surface at $t = 10$ sec, what would its speed be at this time?
(7) At what time the rock could reach a maximum height of 80 meters?
Hint: Find the value of a corresponding to each question 6 and 7.