6. [10 points] Your eccentric neighbor is rollerblading down the street away from you at constant speed with cardboard wings strapped to his back. He is 30 meters away from you when rockets strapped to his rollerskates ignite and quickly burn out. The **velocity** $v(t)$ of your neighbor, measured in meters per second, t seconds after he starts moving away from you is given below.

$$v(t) = \begin{cases} 4 & \text{if } 0 \le t \le 5 \\ -.64t^2 + 12.8t - 44 & \text{if } 5 < t \le 10 \\ -1.9t + 39 & \text{if } 10 < t \le 20 \end{cases}$$

a. [1 point] At what t value did the rockets ignite?

Solution:

The rockets ignited at $t =$ _____5_____

Let $p(t)$ be the **distance** between you and your neighbor, measured in meters, t seconds after he starts moving away from you.

b. [4 points]
Determine the value of $p(0)$ and $p(10)$.

Solution:

$p(0) =$ _____10_____
$p(10) =$ _____310/3_____

c. [5 points] Sketch a well-labeled graph of $p(t)$ on the domain $0 \le t \le 20$ being sure the concavity of the graph is clear.

Solution: