1. [10 points] Unfortunately, Sebastian left the King's castle but never made it to Adam's manor because the brakes on his car were sabotaged. Sebastian was driving on a straight road between the King's castle and Adam's manor when he found himself unable to brake and racing down a hill. Let $v(t)$ be Sebastian's velocity (in kilometers per minute) t minutes after he left the King's castle. Note that $v(t)$ is positive when Sebastian is traveling towards Adam's manor. Sebastian suspected he was being followed so he occasionally backtracked.
Sebastian crashed 30 minutes into his journey. A graph of $v(t)$ is given below.
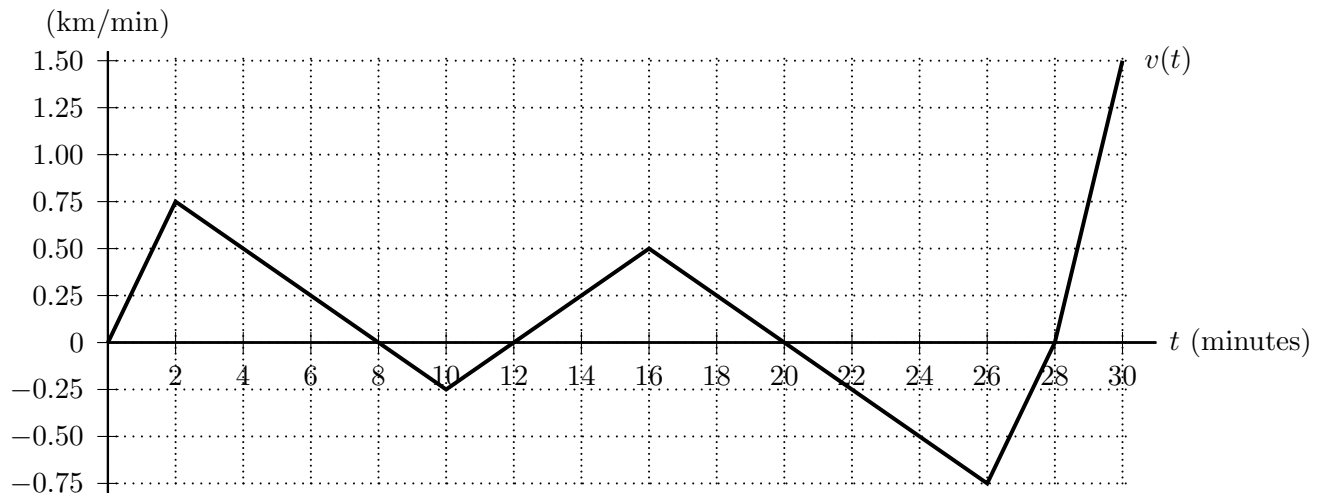
a. [3 points] How far from the King's castle was Sebastian 12 minutes into his journey? *Include units.*

Answer: _____

b. [2 points] What was Sebastian's average velocity during the first 12 minutes of his journey?

Answer: _____

c. [2 points] Of the four times below, circle the one at which Sebastian's acceleration was the greatest (i.e. most positive).

$t = 6$ $t = 13$ $t = 20$ $t = 27$

d. [3 points] In the interval $0 \le t \le 30$ when was Sebastian the closest to the King's castle? When was he the furthest from the King's castle?

Answer: Sebastian was the closest to the King's castle at $t = $ _____.

Sebastian was the furthest from the King's castle at $t = $ _____.