

Uniform Acceleration – Practice

/14

Name: _____

Date: _____



The Search for the Peanut!

Analyze **Vector the Elephant**'s motion as he walks around Physics' Land in search of a tasty *peanut* treat. His motion is described as follows.

A) *Vector* starts from a speed of 5 m/s and accelerates to a final speed of 20 m/s in 10 seconds.

Calculate the acceleration and the distance he travelled in this time.

B) *Vector* then continues walking for 30 seconds at a constant speed (use the final speed from the previous part as the new initial speed). Calculate the acceleration and the distance travelled in this time.

C) Thinking that he smells the peanut *Vector* decelerates at 2 m/s/s down to a speed of 9 m/s. How much time does this reduction in speed take? Calculate the distance covered in this time.

D) Realizing he was not smelling a peanut, but instead a pair of *dirty socks* he speeds up again to a speed of 25 m/s in 15 s. Calculate the acceleration and distance travelled in this time.

E) He travels at the new constant speed (from part D) for 5 seconds. What is the acceleration? Calculate the distance he travelled in this time.

F) At this point he sees the peanut! It is exactly 60m away from him. He grinds to a halt and eats his tasty peanut. Yay! Calculate his acceleration, average speed and distance travelled during this last part of the great search. Also, calculate the total distance travelled by vector while searching for the peanut.



Part B: Graphing the Motion and Checking Your Solutions

Go back to your problem and for each section a) through to f) **plot the speed-time (v-t) graph** very neatly and label each section clearly with the letter corresponding to the section. For each section you must calculate **1) the slope** (what does this represent?) and **2) the area** (what does this represent?) - Show your work in the space provided below or very neatly on the graph itself. Compare your results with the results from your mathematical calculations.