[11-12-15-T]

Linear function

Imagine a two lane highway with one lane East bound and the other lane West bound.
Car 1 is headed East at a constant speed of 60 mph. Car 2 headed West at a constant speed of 90 mph. Points A and B on this highway are 600 miles apart. At the instant Car 1 passes point A, Car 2 passes point B. We take as time equals zero, the moment when the cars pass the points A and B.

We already realized that the cars approach each other until they pass each other. After passing each other, the cars travel away from each other.

[A] Draw a diagram that represents the facts given in the problem above. Use "d" to represent the distance between the cars before they pass each other.

(1) What is the largest value *d* can take? At what time does *d* take this value?

(2) What is the smallest value *d* can take? At what time does *d* take this value?

(3) Write an equation that tells the value of *d* as determined by time *t*. The equation should be valid up to and including the moment the cars pass each other.

(4) Is your equation true for the distances and times in (1) and (2) above?

(5) Make a table that shows the distance for each of these values of *t*: 0, 1, 2, 3, 4.

(6) Plot the values given by your table. You will plot just four points.

(7) Would it be reasonable to connect the points by drawing a line through them?

(8) What is the range of values that *t* can take? And that *d* can take?

(9) Would you say that *d* is increasing or decreasing as *t* increases?

[B] Draw a diagram that represents the facts given in the problem above. Use "d" to represent the distance between the cars *after* they pass each other.

(1) What is the largest value *d* can take?

(2) What is the smallest value *d* can take? At what time does *d* take this value?

(3) Write an equation that tells the value of *d* as determined by time *t*.

(4) Is your equation true for the distance in (2) above?

(5) Make a table that shows the distance for some values of *t*.

(6) Plot the values given by your table.

(7) Would it be reasonable to connect the points by drawing a line through them?

(8) What is the range of values that *t* can take? And that *d* can take?

(9) Would you say that *d* is increasing or decreasing as *t* increases?