2.3 Question 1

Ian runs at a constant speed and travels 9 meters in 4 seconds.

a. If Ian runs for 8 seconds at this constant speed, how far will he travel?

18 meters

9 meters 4 meters
·2 meters +4 or ·2
18 meters 8 meters

For this question I wasn't sure of the constant speed which is why I multiplied by 2 since I had seen a pattern.

This question is mostly about constants and finding the rate of change in order to interpret and problem & find the solution.

b. If Ian runs 1 second at this constant speed, how far will he travel?

2.25 meters $\frac{9}{4} \rightarrow 2.25$ From the first question I noticed that every 4 seconds it went by 9. So what I did was multiply 9 by 4 to see what the constant would be. This way I could find 1 second.

c. What is the constant speed that Ian runs at?

2.25 meters per second $2.25 \cdot 4 = 9$ One thing that I know is that from 0→1 it was 2.25 so that was the constant. I envisioned this as a table in order to see the constant & the rate at which it changes.

d. If Ian runs for 3.4 seconds at this constant speed, how far will he travel?

7.64999 meters Since we know the constant we can create an expression. $2.25x$. This means that x is in terms of time in this case seconds. $2.25 \cdot 3.4 = 7.64999$.

2.4 question 8

A tortoise and a hare are competing in a 2000-meter race. The arrogant hare decides to let the tortoise have a 580 meter head start. When the start gun is fired the hare begins running at a constant speed of a meters per second and the tortoise begins crawling at a constant speed of 6 meters per second.

Being able to interpret what the question is asking for. This also makes us think about two variables and how we can apply it into our expression.

a. expression in terms of t that represents the hare's distance from the starting line. We are given that the constant speed of the hare is a therefore its at.

at

a is the constant so it won't change.

b. expression in terms of t that represents the tortoise's distance from the starting line. We are given 580 is the total "starting line". The start is 2000 meters but the tortoise was given a headstart of 580. This means that we have to add 580 to the expression. The constant of the tortoise is 6. This means that the total/expression would be 580+6t.

580+6t

c. expression in terms of t that represents the # of meters the tortoise is ahead of the hare.

580+6t-at

We want the distance b/w the tortoise & the hare. This means tortoise − hare. So we get 580+6t since 6t is the constant for the tortoise & 580 for the headstart that it was given. Then we subtract at since that is the constant of the hare.

d. who finishes the race first

The hare

$2000 = 580+6t$
$-580 \quad -580$

$1420/6 \rightarrow 236.666$

I used the first two expressions & equaled them to 2000. Then I solved for them. It showed that the hare had finished much earlier than the tortoise.

2.4 question 7

Kristina goes on a road trip; her car gets 28 miles per gallons (mpg) & gas cost $3.38 per gallon. Let n represents the # of miles Kristina has traveled since she started driving.

a. Suppose Kristina has traveled 297 miles (n=297) since she started driving?

i. How many gallons of gasoline has Kristina used since she started driving? what i did was dude 297 by 28 10.6071 b/c 28 miles per gallons will allow us to know the amount of gallons that had to be used. Therefore our answer is 10.6071.

once again this question is about the rate of change & being able to find an expression to help out with finding the solution.

ii. what is the cost of the gasoline that Kristina has used since she started driving? since we found out how many $35.8521 gallons Kristina used in her 297 mile car ride we simply have to multiply that by 3.38. 3.38 is the amount per gallon.

b. write an expression in terms of n that represents the # of gallons of gasoline Kristina has used since she started driving n/28 gallons. Basically what i have to do is use the expression for ai and plug it here.

we divide b/c depending on the miles we divide by 28 since it takes 28 miles for 1 gallon to be used up.

C. write an expression in terms of n that represents the cost of the gasoline that Kristina has used since she started driving. Once again we apply a $3.38n/28 to our answer. However, since we are talking about money we add 3.38 to see how much money we spent after n miles.

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2.4 Question 6

A bathtub contains 50 gallons of water and the total weight of the tub and water is approximately 786.25 pounds. You pull the plug and the water begins to drain.

a. Write an expression in terms of v that represents the weight of the water that has drained from the tub (in pounds)

8.345v — its asking to write an expression in terms of the water. This means that 8.345·v is the answer since 8.345 is the water weight per gallons. With 8.345 we will be able to see how much water is being drained after v time.

b. Write an expression in terms of v that represents the total weight of the tub and water (in pounds)

786.25-8.345v — 786.25 is the total weight of the tub and water together. However, the context is telling us that the water is draining which means that the weight is changing. This means that we include 8.345 since its the weight of water in a gallon and v since the time is changing.

c. How much does the tub weight when there is no water in it?

369 — we knew there are 50 gallons of water in total. We also know the weight of the water per gallon. So all we have to do is multiply 8.345·50 and then subtract the answer by the total weight of water & the tub to get our answer.

d. If the weight of the tub and water is 569.28 pounds, how many gallons of water have drained from the tub?

26.0000012 — what i did was subtract the total of water & tub weight by the tub weight. Then I subtracted 569.28 by the tub weight. The two answers that Im left with I subtract. With that answer I divide by 8345 b/c that water weight to get my answer.

For this Problem it mostly focused on making us create Problems (expressions) in which we have to use to apply it to other Problems.