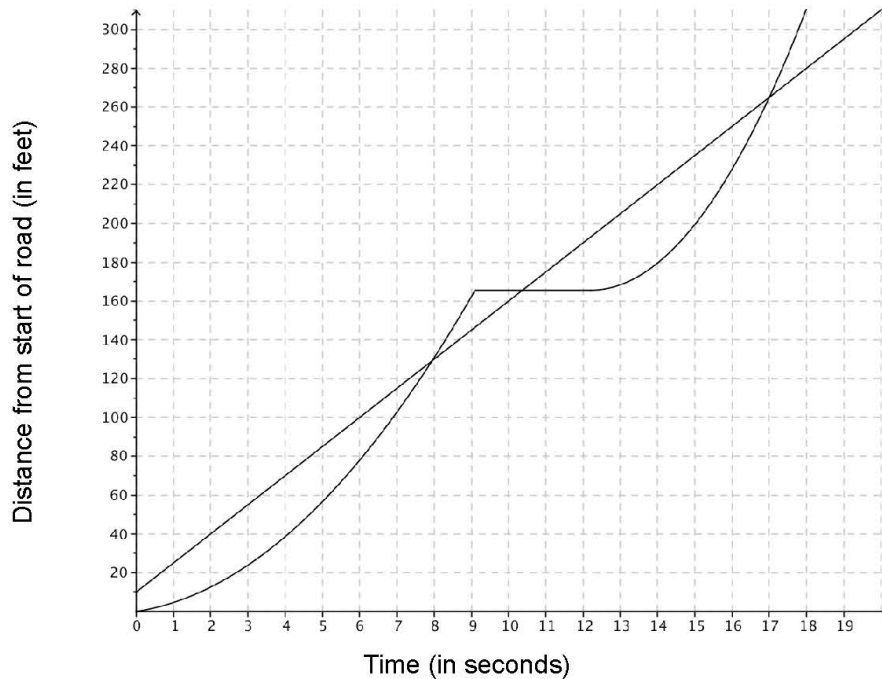


TASK 7

Name _____ Date _____

Bike and Truck

A bicycle traveling at a steady rate and a truck are moving along a road in the same direction. The graph below shows their positions as a function of time. Let $B(t)$ represent the bicycle's distance and $K(t)$ represent the truck's distance.



1. Label the graphs appropriately with $B(t)$ and $K(t)$. Explain how you made your decision.

2. Describe the movement of the truck. Explain how you used the values of $B(t)$ and $K(t)$ to make decisions about your description.

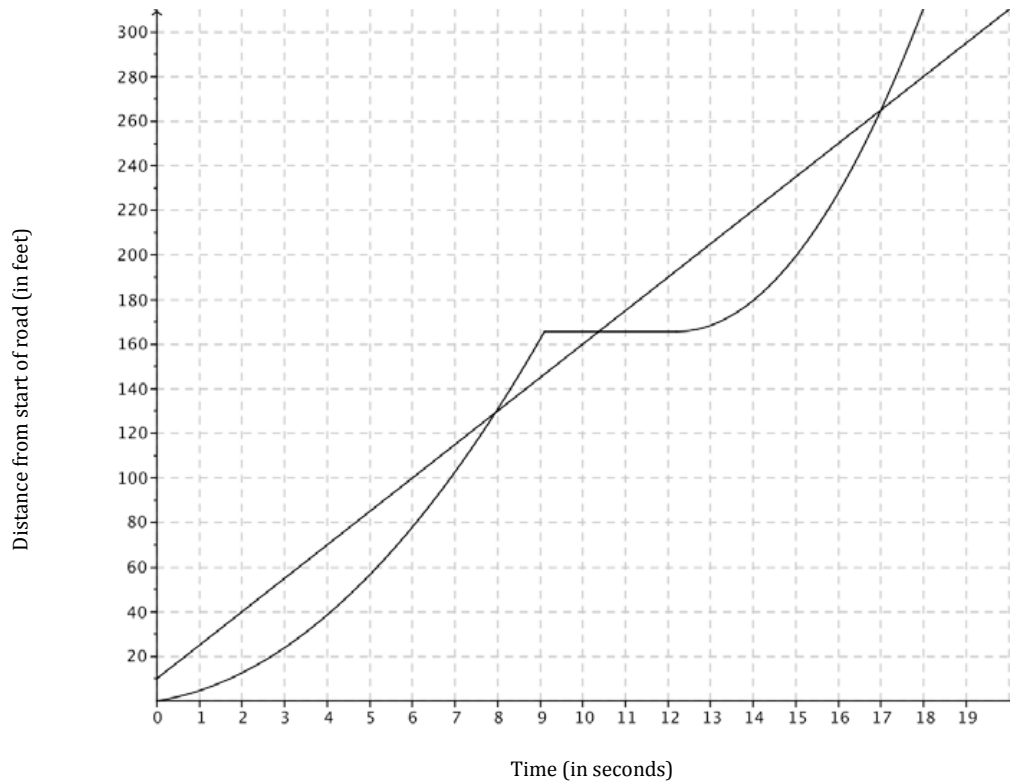
TASK 7

3. Which vehicle was first to reach 300 feet from the start of the road? How can you use the domain and/or range to determine which vehicle was the first to reach 300 feet? Explain your reasoning in words.
4. Jack claims that the average rate of change for both the bicycle and the truck was the same in the first 17 seconds of travel. Explain why you agree or disagree with Jack.



Bike and Truck

A bicycle traveling at a steady rate and a truck are moving along a road in the same direction. The graph below shows their positions as a function of time. Let $B(t)$ represent the bicycle's distance and $K(t)$ represent the truck's distance.



What observations can you make about the Bike and Truck based on the graph?

Truck and Bike Task

Teacher: Shalunda Shackelford

District: Hamilton County School District

Grade: High School Algebra I

- 1 *Teacher:* We know we're talking about the truck. But he got to this point right here
2 and Chris was like, "Oh, that means that the truck was moving along in a
3 straight path at that time." Do you agree? Don't say anything out loud, let
4 everybody get a chance. Do you agree or disagree with Chris? Who
5 agrees with Chris? Jacobi agrees with my imaginary friend. Jacobi, step up
6 baby. Who disagrees with it? Who disagrees with him? I'm going to go
7 with – okay. Okay, Charles. Charles said I have been raising my hand
8 forever. Charles, step up. All right, here we go. Make sure you justify your
9 reasoning. All right, so Jacobi agrees, so I'm going to let Jacobi go first. If
10 you disagree, say something. Well, I'll try to let Charles do it first and see
11 what he's going to say. All right, go ahead Jacobi.
- 12 *Student:* Okay, so I agree because as you can see, he was not going in the constant
13 rate right here. Then he stopped. I can see that he stopped and then—and
14 then he was going real straight, so that's a constant rate. If you go
15 straight and you don't have no–no–you know, curve or anything, then
16 you going up a straight path, but then he came back up. He came back up
17 and he started–started back without a constant rate.
- 18 *Teacher:* Okay. All right, so Jacobi step to the side because it's Charles' turn.
19 Charles, did you hear what he had to say?
- 20 *Student:* Um hmm.
- 21 *Teacher:* All right, do you still disagree with him?
- 22 *Student:* Yes.
- 23 *Teacher:* All right, go ahead and tell me why.
- 24 *Student:* Okay, I disagree because when he stopped, the distance went like – he
25 wasn't keep going because like time is still going, like he's not moving no
26 more and then he probably sped up when he came right there.
- 27 *Teacher:* All right.
- 28 *Student:* I disagree.

- 29 *Teacher:* You still disagree with him? So go back. Charles, he still didn't
30 understand. So Jacobi, I need you to be looking at the graph. I need you
31 to be looking at the graph. Charles, say it one more time. Tell him what
32 you feel.
- 33 *Student:* Okay. When he came up here, he stopped. Time is still going back
34 because he's not moving no more. So the distance isn't going nowhere.
35 And then he speeds up because he's moving again.
- 36 *Student:* Wait a minute. Wait a minute, hold it, hold, hold 'cause you said he
37 stopped right here, but then I'm still not understanding, what did he do
38 right here?
- 39 *Student:* He sped up. He left. Gone.
- 40 *Students:* No, he stopped. He stopped.
- 41 *[Crosstalk]*
- 42 *Teacher:* I'm talking to Portia right now. Correct? All right, time is still moving
43 right? Am I moving?
- 44 *Student:* No.
- 45 *Student:* No.
- 46 *Teacher:* No. See if you can tell me what I'm talking about now. Go ahead.
- 47 *Student:* I kind of agree with the class because how you said how it's not distance
48 and speed. I get what the class is saying now, that he stopped right there
49 and I still disagree with Charles, but I agree with the class that he stopped
50 right there and then—and then he sped up because, you know, when
51 that's on a flat surface, I learned from you that it stops. So it stopped and
52 then it sped up.
- 53 *Student:* Which vehicle was first to reach 300 feet from the start of the road? How
54 can you use the domain and or range to determine which vehicle was the
55 first to reach 300 feet?
- 56 *Student:* My distance equals my y-axis and my time equals my x and distance is my
57 range and time is my domain. So I first went up here to 300 'cause he was
58 – the question had asked me which one reached 300 feet the quickest. So
59 then I went to 300 feet and I came down here and I kept my finger up
60 there it was the highest one, so I just went and scanned to see which one
61 would give me 300 feet the quickest in my time and it was 18 seconds,

- 62 which was the truck. And I went again, then 20 was my bike and I knew
63 that 18 was the quickest before 20. So 18 was my truck.
- 64 *Teacher:* All right, do you agree or disagree?
- 65 *Students:* Agree.
- 66 *Teacher:* Yeah, we all agree with that. Good job. Let's give him a hand, class. All
67 right, now, wait a minute, now people should already have what they're
68 thinking in their head. MaKayla what about you? What are you thinking?
- 69 *Student:* See, my question is probably about the same as Stephanie's because if
70 the truck had stopped, and then the bike kept going, the bike should
71 have got there before the truck did.
- 72 *Student:* That's what I was saying.
- 73 *Teacher:* All right. So I've got some people that are in agreement on this. Wait,
74 wait, wait. I've got some people that are in agreement on this. So I want
75 to see if we can get them to understand what's really going on.
- 76 *Student:* Okay, the truck didn't shortcut. It sped up at a faster rate. It got there
77 before the bike. The bike was at a constant rate, but it doesn't mean that
78 it was going faster. It stayed the at the same speed which made it get
79 there later.
- 80 *Student:* It stayed the same the whole time.
- 81 *[Crosstalk]*
- 82 *Teacher:* Okay, wait, wait, wait. All right, so wait, wait, wait. What are you thinking
83 now?
- 84 *Student:* I agree with what they are saying now. I just didn't understand.
- 85 *Teacher:* What do you think right now?
- 86 *Student:* That – Now that Tony said it in a better way.
- 87 *Student:* I agree with Portia.
- 88 *Teacher:* You agree, why?
- 89 *Student:* Because that's when it was going up the fastest. I mean, yeah, when he
90 sped up.
- 91 *[End of Audio]*

Truck and Bike Task

Teacher: Shalunda Shackelford

District: Hamilton County School District

Grade: High School Algebra I

- 1 *Teacher:* Between what two seconds did the truck drive the fastest? Shh. What do
2 you think and tell me why.
- 3 *Student:* I think it was either 8 and 9 or 7 and 18 because it was the two steepest
4 ways that the truck gave me.
- 5 *Teacher:* All right, so come point to me right quick.
- 6 *Student:* 8 and 9.
- 7 *Teacher:* So do you guys agree that that's a lot steeper than 7 to 9?
- 8 *Student:* Yeah.
- 9 *Teacher:* Okay, wait, wait, let Mykel talk.
- 10 *Student:* The line's going like straighter.
- 11 *Teacher:* So what happens when it's going up – what do you mean by straight?
12 Hold up. Straight this way?
- 13 *Student:* No, like steeper.
- 14 *Teacher:* Steeper. It's going up a lot steeper on that one?
- 15 *Teacher:* How do you know that that was the steepest?
- 16 *Student:* Because they gained a whole lot of speed right there from the bottom
17 one and again, like it went up a lot more.
- 18 *Teacher:* It went up a lot more, so gained a lot more speed.
- 19 *Student:* Yeah 'cause it started from 16 and then it ended up at, like 200, I think.
- 20 *Teacher:* So, we're discussing what?
- 21 *Student:* It covered more distance in the...that time range.
- 22 *Student:* You can find –

- 23 *Teacher:* Right, it covers more distance in the time range there. I like that one
24 better. Chelsea, what do you understand about what Ne’Kail said? Just
25 tell me what you understand about what Ne’Kail said.
- 26 *Student:* The distance got higher in a shorter amount of time.
- 27 *Teacher:* How can we prove which one is the correct answer? Without just saying,
28 oh it looks this way, it looks that way, blah, blah. All right, Tony, you’re
29 absolutely sure on this one?
- 30 *Student:* Yes, I am so confident.
- 31 *Teacher:* All right, let me hear it. Wait, wait, everybody else should be what?
32 Listening. Unless you’re trying to figure it out, you can just be writing on
33 your paper. Go ahead.
- 34 *Student:* See, in those 2 seconds, you’ve got to see how much time was like—how
35 much distance was covered there and over there.
- 36 *Teacher:* Okay so then –
- 37 *Student:* And then if the numbers are bigger, then you know which one. I haven’t
38 done it yet.
- 39 *Teacher:* Okay, do it. So explain to me what all that means then.
- 40 *Student:* Okay. This showing that the truck went 40 feet in only 1 second and the
41 bike went 40 feet in 2 seconds. So the truck traveled faster.
- 42 *Teacher:* Stephanie, do you understand what she just said about that? Stay right
43 here, Ne’Kail, just be patient.
- 44 *Student:* Yes, now that, like, I finally got the whole equation of it, I understand it.
- 45 *Teacher:* So tell me what you understand now.
- 46 *Student:* Okay, I understand that since he had—first he had stopped awhile, and
47 then he had sped up but the bike like –
- 48 *Teacher:* No, tell me what you understand about what she just said, about what
49 she just said with that—say it one more time Ne’Kail and then Stephanie’s
50 going to listen, so is Tamela, so is MaKayla. The first people that said that
51 they disagreed at first. All right, go ahead.

- 52 *Student:* Okay, both of them had to travel 40 feet and they only took the truck 1
53 second to travel 40 feet, but it took the bike 2 seconds to travel the same
54 distance of 40 feet.
- 55 *Student:* Okay, so what she's saying is it took the truck to travel 40 feet and also
56 the bike to travel 40 feet, but the truck got there in 1 second.
- 57 *Teacher:* And the—what?
- 58 *Student:* And the bike got there in 2 seconds.
- 59 *Student:* The bike got there in 2 seconds, but the truck got there in 1 second.
- 60 *Teacher:* So who went faster?
- 61 *Student:* The truck.
- 62 *Teacher:* The truck. Tell me what you understood about this.
- 63 *Student:* I said that the—okay, that the bike, it got—it took 40, 40 feet in 2 seconds
64 and then the truck, it took 40 feet in 1 second.
- 65 *Teacher:* So who went faster, girl?
- 66 *Student:* The truck.
- 67 *Teacher:* The truck.
- 68 *[End of Audio]*