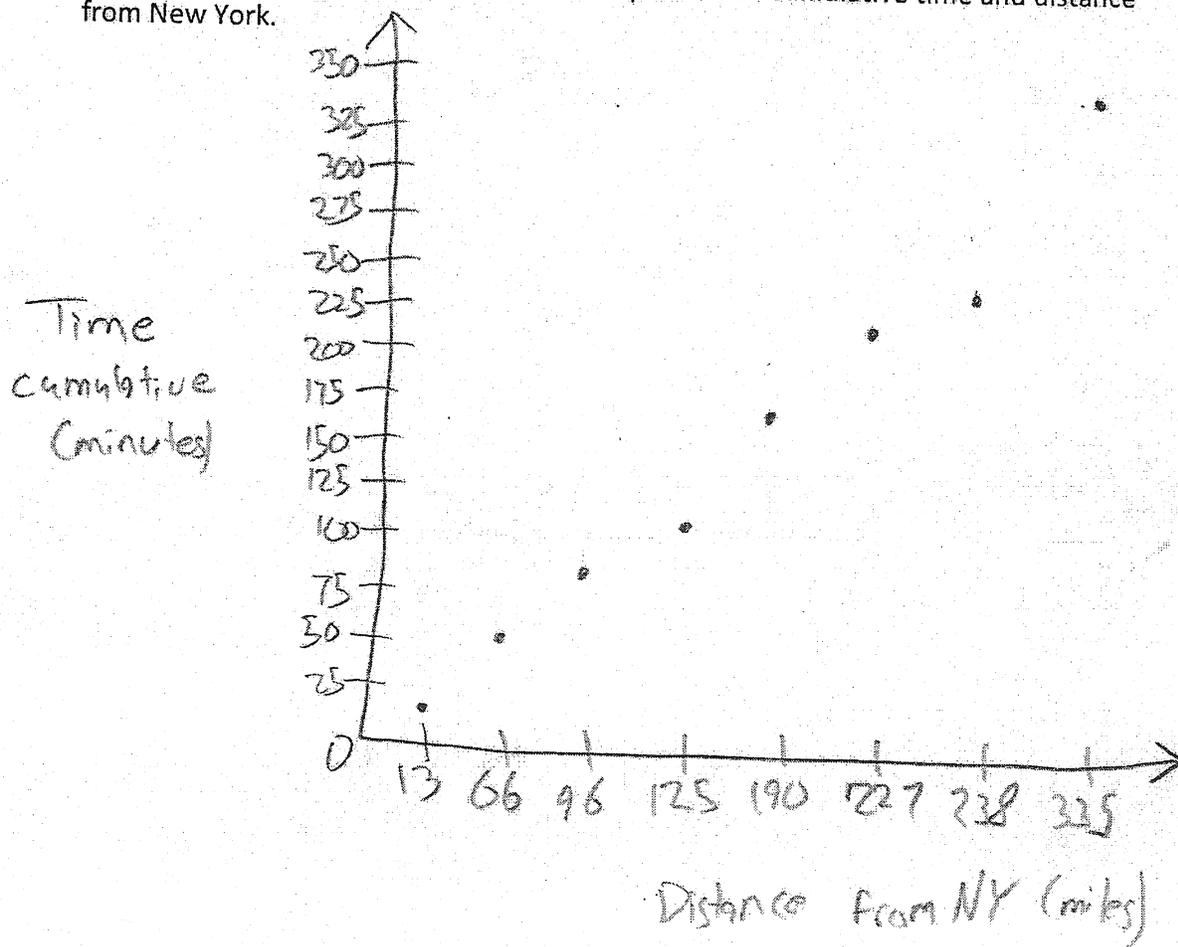


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Alexandria, VA	10:12AM	237	238
Richmond, VA - Staples Mill Road	11:50AM	335	335

1. Create a scatterplot showing the relationship between cumulative time and distance from New York.



2. Determine an equation that could be used to help predict the cumulative time at which the Palmetto train will be passing some landmarks that are specific distances from New York along the route.

$$y = 0.995x + 8.407$$

3. Interpret the slope and y-intercept of your equation in the context of this problem.

$$\text{slope} = 0.995$$

$$\text{y-intercept} = -8.407$$

4. The Palmetto passes one landmark just before the train stops in Washington DC, approximately 220 miles from New York. Use your equation to predict the amount of time that will have elapsed between when the train left New York and when it passes this landmark. How accurate do you think this prediction will be? Explain your thinking and justify your prediction.

210 minutes

This prediction could be a little inaccurate because not all of the other points work perfectly with the equation.

5. On January 17, 2012, the Palmetto train was delayed and held at New York City, Penn Station for 25 minutes due to mechanical repairs. Assuming that the remainder of the route continued as normal, what could be the new line of best fit that represents the distance traveled over time for this route? Justify your response.

$$y = 0.995x + 16.593$$

Since 25 minutes were added to the time, the dependent variable, you can add 25 to the y-intercept.

6. Dynamic Enterprises, a business based out of New York City, has an office in Richmond, VA. Many employees will be traveling regularly between the New York City office and the Richmond office. Dynamic Enterprises is interested in a train route that travels from New York City, Penn Station to Richmond, VA in about 3.5 hours. If a new route were to be developed to accommodate this request, what mathematical representation could model this new route? What equation could be used to model this new route? What are the implications of creating this new route?

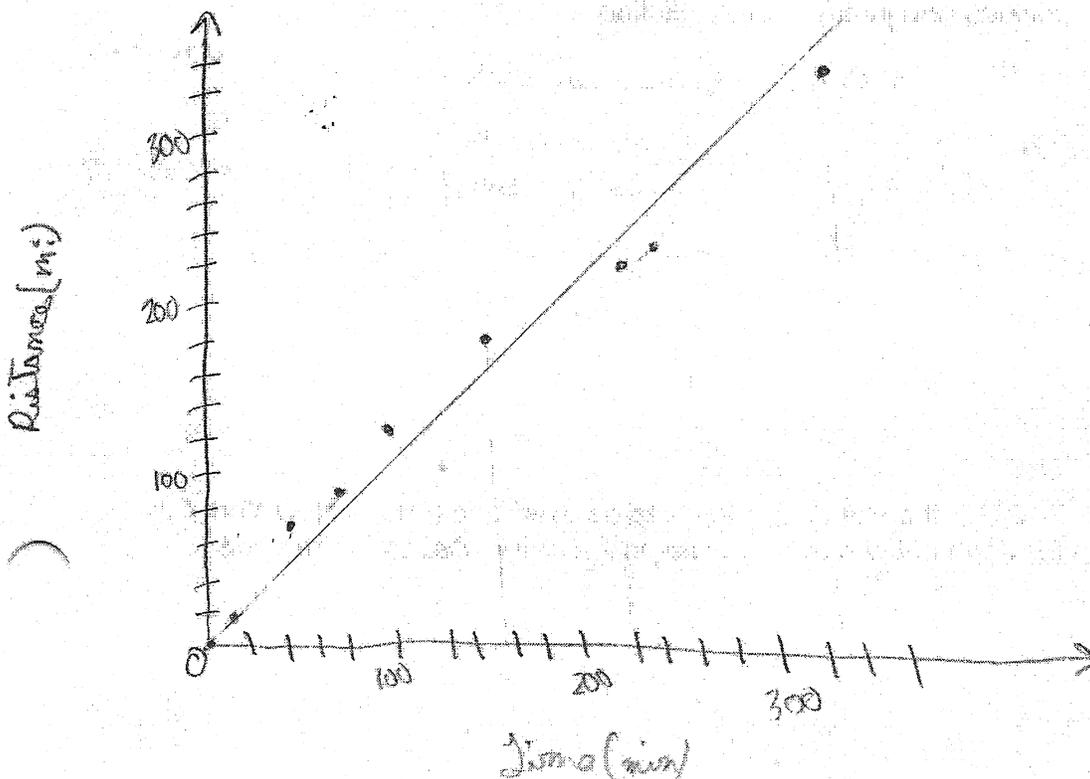
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1. Create a scatterplot showing the relationship between cumulative time and distance from New York.



2. Determine an equation that could be used to help predict the cumulative time at which the Palmetto train will be passing some landmarks that are specific distances from New York along the route.

$$y = 0.9948x + 9.8144$$

3. Interpret the slope and y-intercept of your equation in the context of this problem.

slope = miles/min of the train

y-int = initial distance from New York

4. The Palmetto passes one landmark just before the train stops in Washington DC, approximately 220 miles from New York. Use your equation to predict the amount of time that will have elapsed between when the train left New York and when it passes this landmark. How accurate do you think this prediction will be? Explain your thinking and justify your prediction.

$$220 = 0.9948x + 9.8144$$

$$210.1856 = 0.9948x$$

$$x = \frac{210.1856}{0.9948}$$

$$x = 211.2842$$

- time elapsed around 211 minutes
- this prediction could be off by around 10 to 20 minutes ±

5. On January 17, 2012, the Palmetto train was delayed and held at New York City, Penn Station for 25 minutes due to mechanical repairs. Assuming that the

remainder of the route continued as normal, what could be the new line of best fit that represents the distance traveled over time for this route? Justify your response.

$$y = 0.9948x - 15.0546$$

this makes the 'miles from new york' (y-intercept) negative 15 this means the time it would take the train to travel = 24.87 miles in 25 min, but instead of travelling for 25 min the train was stopped so 'mileage' built up that it had to make up

- 6. Dynamic Enterprises, a business based out of New York City, has an office in Richmond, VA. Many employees will be traveling regularly between the New York City office and the Richmond office. Dynamic Enterprises is interested in a train route that travels from New York City, Penn Station to Richmond, VA in about 3.5 hours. If a new route were to be developed to accommodate this request, what mathematical representation could model this new route? What equation could be used to model this new route? What are the implications of creating this new route?

335 mil
2.10 min
218.7 mil

-math representation of new route -
335 = 1.5952(2.10)
or
218.7 = 0.9948(2.10) + 9.8144

-equation of new route, $y = 1.5952x$ or $y = 0.9948x + 9.8144$

-implications: faster train speed
or less mileage

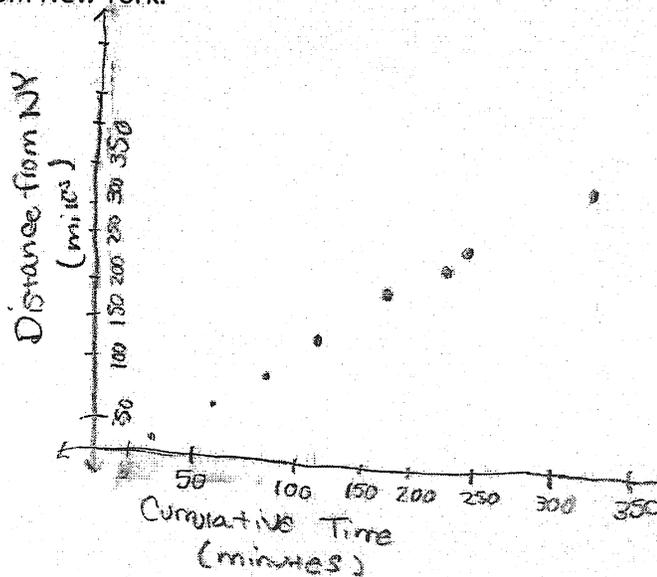
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1. Create a scatterplot showing the relationship between cumulative time and distance from New York.



2. Determine an equation that could be used to help predict the cumulative time at which the Palmetto train will be passing some landmarks that are specific distances from New York along the route.

$$y = x + 10$$

3. Interpret the slope and y-intercept of your equation in the context of this problem.

1 and 10

4. The Palmetto passes one landmark just before the train stops in Washington DC, approximately 220 miles from New York. Use your equation to predict the amount of time that will have elapsed between when the train left New York and when it passes this landmark. How accurate do you think this prediction will be? Explain your thinking and justify your prediction.

210 minutes

not accurate

$$220 = x + 10$$

due to estimation

5. On January 17, 2012, the Palmetto train was delayed and held at New York City, Penn Station for 25 minutes due to mechanical repairs. Assuming that the remainder of the route continued as normal, what could be the new line of best fit that represents the distance traveled over time for this route? Justify your response.

$$y = x - 28$$

6. Dynamic Enterprises, a business based out of New York City, has an office in Richmond, VA. Many employees will be traveling regularly between the New York City office and the Richmond office. Dynamic Enterprises is interested in a train route that travels from New York City, Penn Station to Richmond, VA in about 3.5 hours. If a new route were to be developed to accommodate this request, what mathematical representation could model this new route? What equation could be used to model this new route? What are the implications of creating this new route?

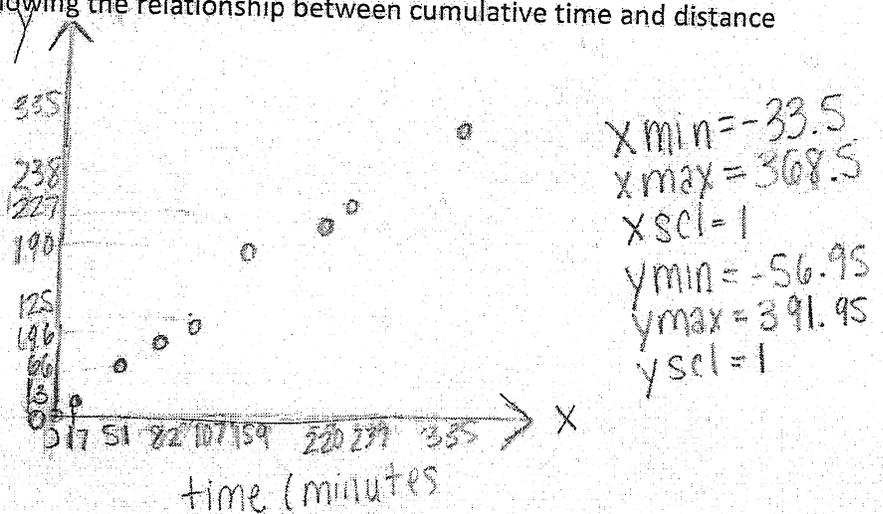
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1. Create a scatterplot showing the relationship between cumulative time and distance from New York.



2. Determine an equation that could be used to help predict the cumulative time at which the Palmetto train will be passing some landmarks that are specific distances from New York along the route.

$$y = 0.9947600492x + 9.814428952$$

3. Interpret the slope and y-intercept of your equation in the context of this problem.

$$\text{slope} = 0.9947600492$$

$$\text{y-intercept} = 29.91092084$$

$$y - y_1 = m(x + x_1)$$

$$y - 13 = .994760(x + 17)$$

$$y - 13 = .994760x + 16.91092084$$

$$y = 0.994760x + 29.91092084$$

4. The Palmetto passes one landmark just before the train stops in Washington DC, approximately 220 miles from New York. Use your equation to predict the amount of time that will have elapsed between when the train left New York and when it passes this landmark. How accurate do you think this prediction will be? Explain your thinking and justify your prediction.

210 minutes. Based upon the graph, it would take about 10 minutes to travel 7 miles.

Therefore, you would subtract 10 from 220, which gives you 210 minutes. This is a pretty accurate prediction.

5. On January 17, 2012, the Palmetto train was delayed and held at New York City, Penn Station for 25 minutes due to mechanical repairs. Assuming that the remainder of the route continued as normal, what could be the new line of best fit that represents the distance traveled over time for this route? Justify your response.

I added 25 minutes to all of the values (besides zero) in the first column, and plugged it into the calculator. The new line of best fit is $y = 0.9610900492x - 7.023865481$

6. Dynamic Enterprises, a business based out of New York City, has an office in Richmond, VA. Many employees will be traveling regularly between the New York City office and the Richmond office. Dynamic Enterprises is interested in a train route that travels from New York City, Penn Station to Richmond, VA in about 3.5 hours. If a new route were to be developed to accommodate this request, what mathematical representation could model this new route? What equation could be used to model this new route? What are the implications of creating this new route? 3.5 hours = 210 minutes

$$y = 1.595238095x$$

It would be difficult to travel this far in the given time.

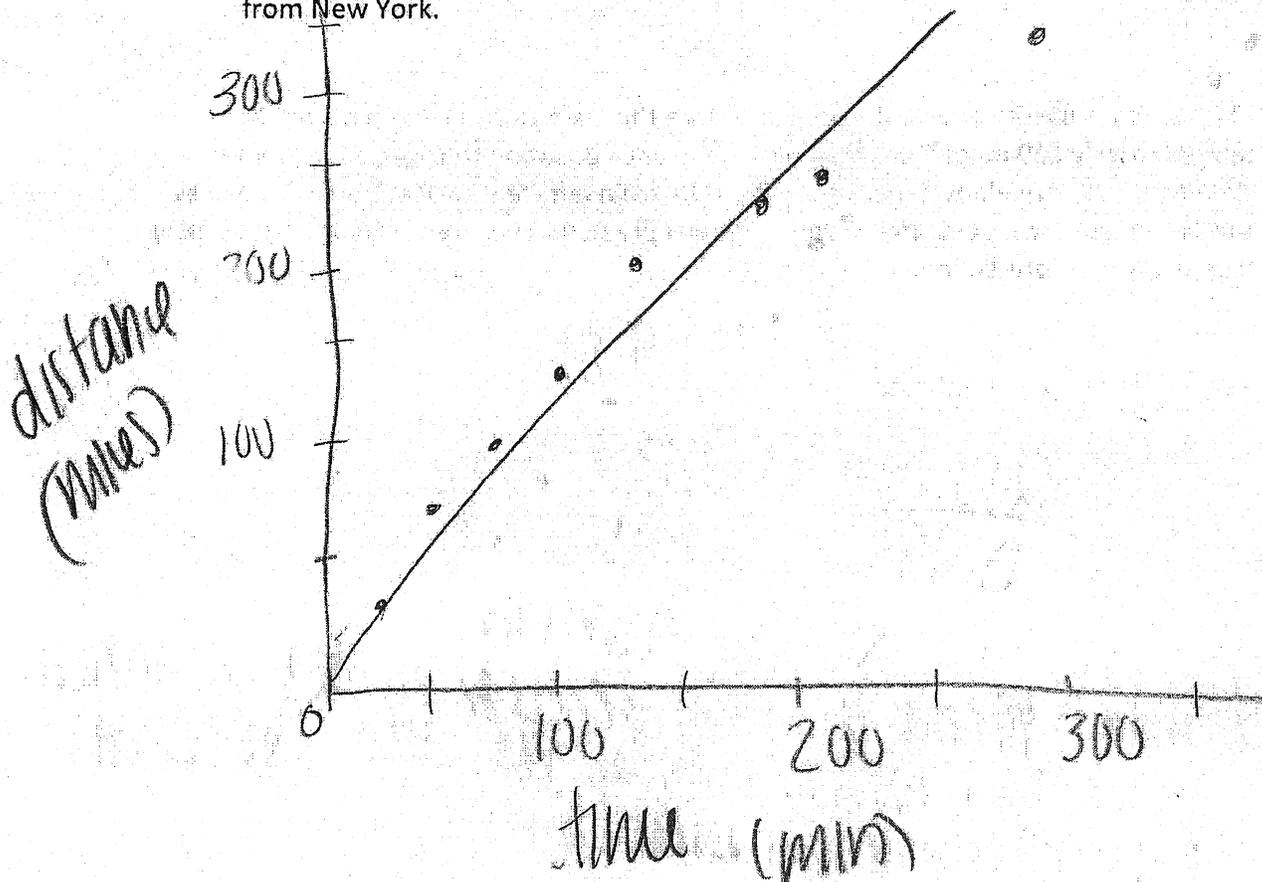
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1. Create a scatterplot showing the relationship between cumulative time and distance from New York.



2. Determine an equation that could be used to help predict the cumulative time at which the Palmetto train will be passing some landmarks that are specific distances from New York along the route.

$$y = 0.995x + 9.814$$

3. Interpret the slope and y-intercept of your equation in the context of this problem.

$$\text{slope} = 0.995$$

$$\text{y-intercept} = 9.814$$

4. The Palmetto passes one landmark just before the train stops in Washington DC, approximately 220 miles from New York. Use your equation to predict the amount of time that will have elapsed between when the train left New York and when it passes this landmark. How accurate do you think this prediction will be? Explain your thinking and justify your prediction.

$$220 = 0.995x + 9.814$$

$$\frac{220 - 9.814}{0.995} = \frac{0.995x}{0.995}$$

$$x = 211 \text{ minutes}$$

I think that is pretty accurate because as the distances get further and further away, the space between miles and minutes gets smaller.

5. On January 17, 2012, the Palmetto train was delayed and held at New York City, Penn Station for 25 minutes due to mechanical repairs. Assuming that the remainder of the route continued as normal, what could be the new line of best fit that represents the distance traveled over time for this route? Justify your response.

$$y = 0.96x - 7.02$$

you add 25 to all of the x-values (minutes)

6. Dynamic Enterprises, a business based out of New York City, has an office in Richmond, VA. Many employees will be traveling regularly between the New York City office and the Richmond office. Dynamic Enterprises is interested in a train route that travels from New York City, Penn Station to Richmond, VA in about 3.5 hours. If a new route were to be developed to accommodate this request, what mathematical representation could model this new route? What equation could be used to model this new route? What are the implications of creating this new route?

$$y = 1.5x$$

faster train. — there would have to be a

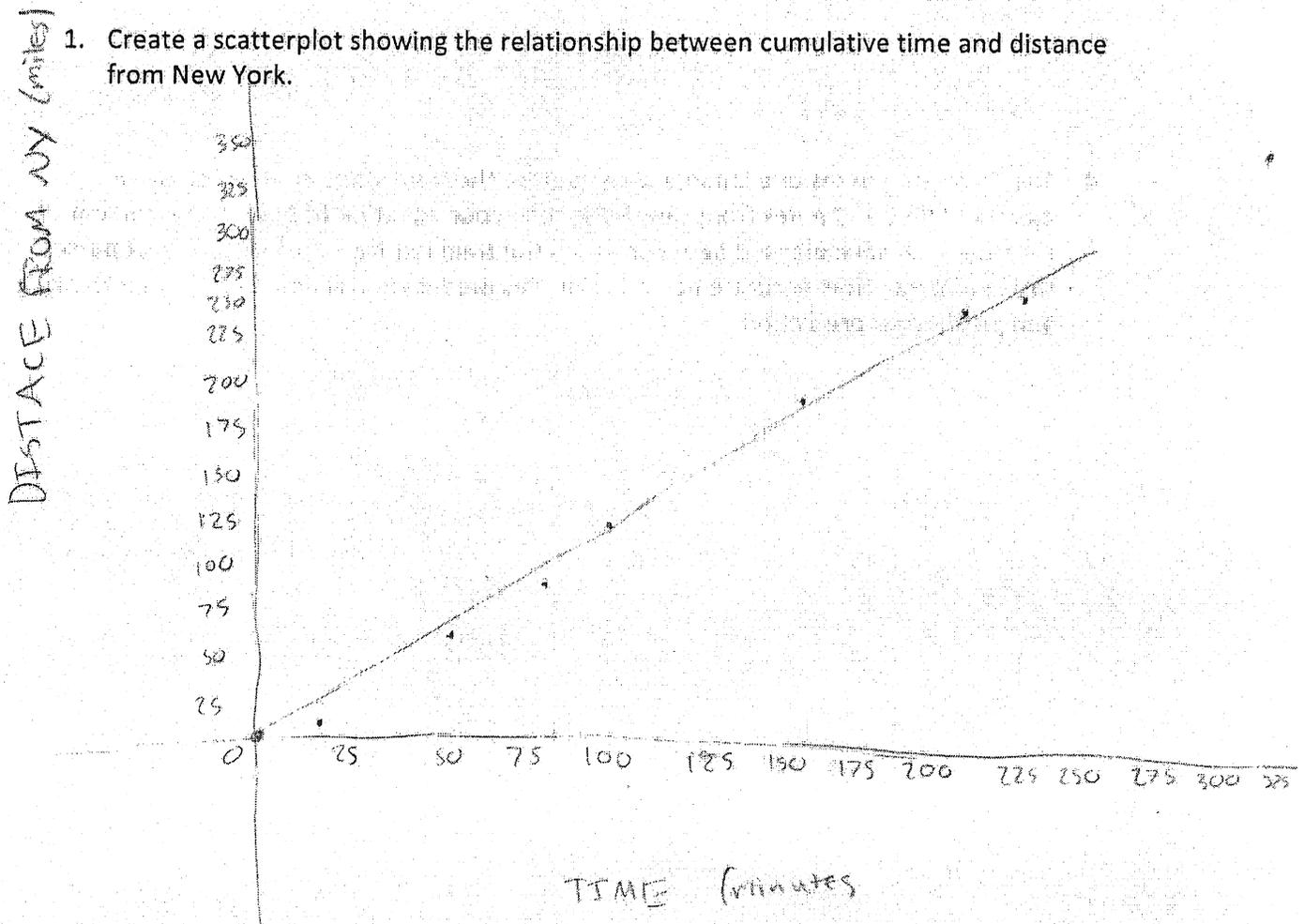
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2. Determine an equation that could be used to help predict the cumulative time at which the Palmetto train will be passing some landmarks that are specific distances from New York along the route.

$$17 = 1.07(13) + b$$

$$y = 1.07x + b$$

$$17 = 13.882(13) + b$$

$$y = 1.07x + 3.1$$

$$3.1 = b$$

3. Interpret the slope and y-intercept of your equation in the context of this problem.

$$y\text{-int} = 3.1$$

$$\text{slope} = 1.07$$

4. The Palmetto passes one landmark just before the train stops in Washington DC, approximately 220 miles from New York. Use your equation to predict the amount of time that will have elapsed between when the train left New York and when it passes this landmark. How accurate do you think this prediction will be? Explain your thinking and justify your prediction.

$$y = 1.07(220) + 3.1$$

$$y = 238.8$$

239 minutes, 10:13 am

This prediction isn't accurate enough due to the estimation, but it is precise compared to the other statistics.

5. On January 17, 2012, the Palmetto train was delayed and held at New York City, Penn Station for 25 minutes due to mechanical repairs. Assuming that the remainder of the route continued as normal, what could be the new line of best fit that represents the distance traveled over time for this route? Justify your response.

The line of best fit would change due to the inconsistency of the scatter plot and the data, the equation would change as well.

6. Dynamic Enterprises, a business based out of New York City, has an office in Richmond, VA. Many employees will be traveling regularly between the New York City office and the Richmond office. Dynamic Enterprises is interested in a train route that travels from New York City, Penn Station to Richmond, VA in about 3.5 hours. If a new route were to be developed to accommodate this request, what mathematical representation could model this new route? What equation could be used to model this new route? What are the implications of creating this new route?

A similar equation would be used because it has to pass through the other cities.

$$y = 1.07x + 0.67$$

The route has to be following the specific equation in order to be right about the time (NY to VA, 3.5 hours).

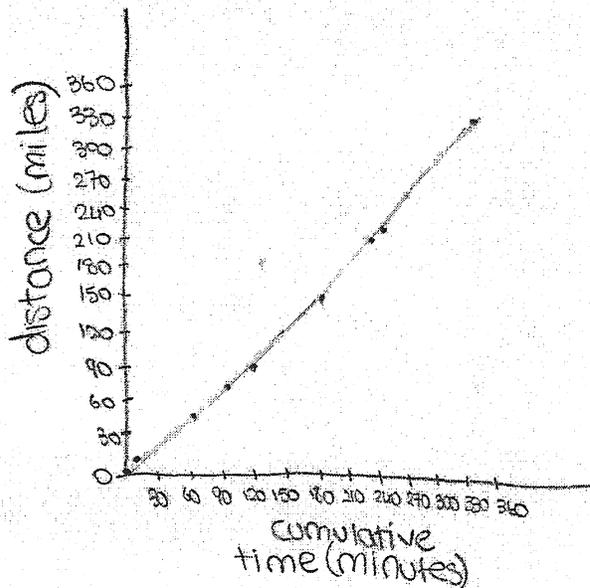
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Washington DC	9:55AM	220 245	227 252
Alexandria, VA	10:12AM	237 262	238 263
Richmond, VA - Staples Mill Road	11:50AM	335 360	335 360

1. Create a scatterplot showing the relationship between cumulative time and distance from New York.



2. Determine an equation that could be used to help predict the cumulative time at which the Palmetto train will be passing some landmarks that are specific distances from New York along the route.

$$y = .994x + 9.81$$

3. Interpret the slope and y-intercept of your equation in the context of this problem.

$$\text{Slope} = 0.994$$

$$\text{y-intercept} = 9.81$$

4. The Palmetto passes one landmark just before the train stops in Washington DC, approximately 220 miles from New York. Use your equation to predict the amount of time that will have elapsed between when the train left New York and when it passes this landmark. How accurate do you think this prediction will be? Explain your thinking and justify your prediction.

$$228.49?$$

5. On January 17, 2012, the Palmetto train was delayed and held at New York City, Penn Station for 25 minutes due to mechanical repairs. Assuming that the remainder of the route continued as normal, what could be the new line of best fit that represents the distance traveled over time for this route? Justify your response.

$$y = .961x - 7.024$$

When you add 25 minutes to each of the original timings, the equation is different.

6. Dynamic Enterprises, a business based out of New York City, has an office in Richmond, VA. Many employees will be traveling regularly between the New York City office and the Richmond office. Dynamic Enterprises is interested in a train route that travels from New York City, Penn Station to Richmond, VA in about 3.5 hours. If a new route were to be developed to accommodate this request, what mathematical representation could model this new route? What equation could be used to model this new route? What are the implications of creating this new route?

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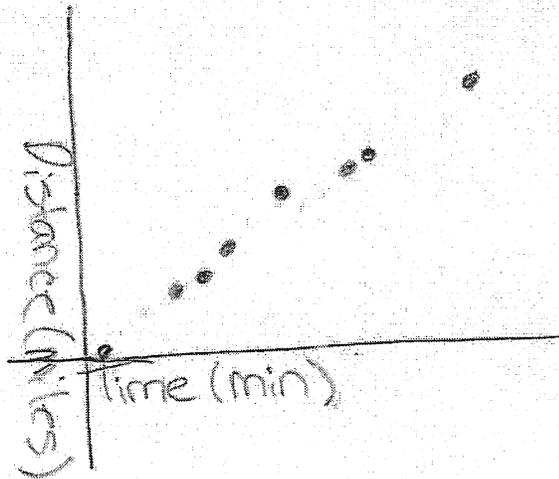
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1. Create a scatterplot showing the relationship between cumulative time and distance from New York.

$$y = .995x + 9.814$$



2. Determine an equation that could be used to help predict the cumulative time at which the Palmetto train will be passing some landmarks that are specific distances from New York along the route.

$$y = .995x + 9.814$$

3. Interpret the slope and y-intercept of your equation in the context of this problem.

$$\text{slope} = .995$$

$$y\text{-intercept} = 9.814$$

Slope is how fast the time is passing.

Y-intercept is the original starting distance.

4. The Palmetto passes one landmark just before the train stops in Washington DC, approximately 220 miles from New York. Use your equation to predict the amount of time that will have elapsed between when the train left New York and when it passes this landmark. How accurate do you think this prediction will be? Explain your thinking and justify your prediction.

$$\begin{array}{r} 220 = .995x + 9.814 \\ -220 \qquad \qquad -220 \\ \hline -.995x - 210.186 \\ \underline{-.995} \qquad \underline{.995} \\ x = -211.24 \end{array}$$

Since y represents the distance in miles, I put the 220 miles in for y and solved for x.

5. On January 17, 2012, the Palmetto train was delayed and held at New York City, Penn Station for 25 minutes due to mechanical repairs. Assuming that the remainder of the route continued as normal, what could be the new line of best fit that represents the distance traveled over time for this route? Justify your response.

$$y = .995(x+25) + 9.814$$

I added 25 to x
to represent the
25 min delay.

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$$y = 1.6x + 0$$

The implication
would be the
train would have
to go in a completely
straight line.

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