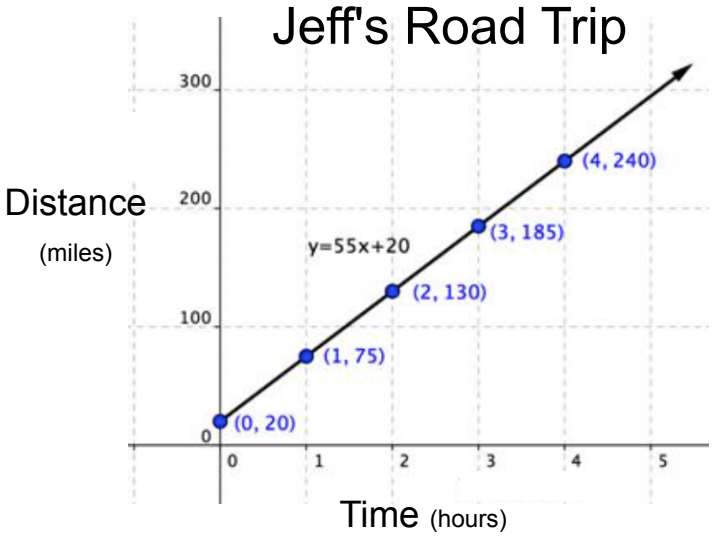
Warm Up

10/22

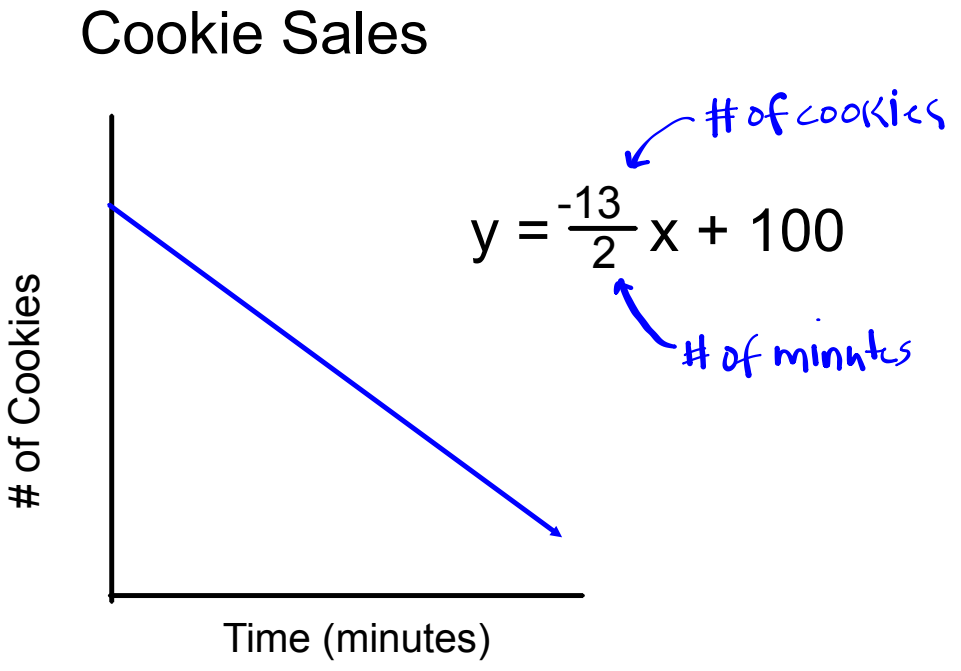


y = 55x + 20

What does the slope of this graph tell us about Jeff's Road Trip?

$\frac{55 \text{ miles}}{1 \text{ hour}}$

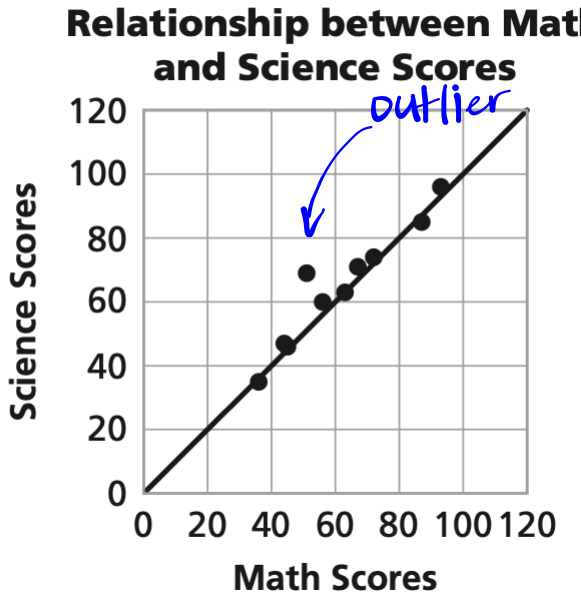
for every hour Jeff travels 55 miles



They sell 13 cookies every 2 minutes

Homework Questions?

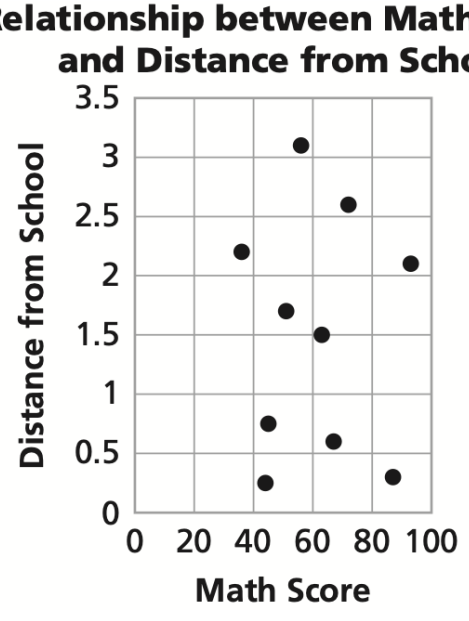
6. a.



Are math & science scores related?

Yes

7. a.



No relationship

Makes sense

Problem 4.1

The table shows the height and arm span of students in a CMP class.

Height (in.)	56	57	57	58	59	60	60	60	62	64	64	66	67	67	67	68
Arm span (in.)	54	57	54	61	56	58	59	60	62	63	62	62	65	67	69	67

Do you think the data support the claim that arm span and height are about equal?

A Analyze the data to test your ideas.

1. Plot the (height, arm span) data on a coordinate graph. The resulting graph is called a **scatter plot**.
2. Do you think the scatter plot supports the claim that arm span and height are about equal for most people?

continued on the next page >

Graph containing a bunch of points

3. If each student in the class had arm span s equal to height h, what equation would relate the two variables?

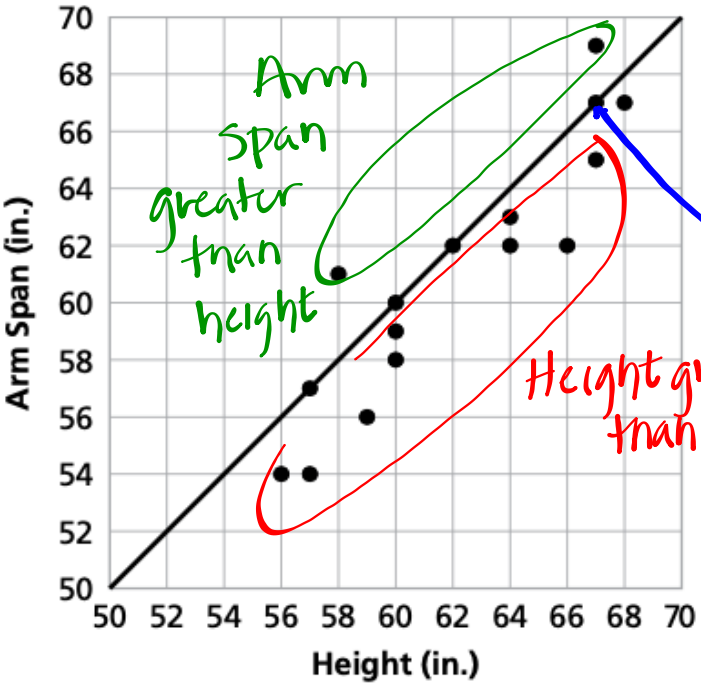
a. Graph the equation on your scatter plot.

b. Which data points (if any) does your line pass through? Explain how arm span and height are related in those points.

c. Choose several data points that are not on your line. Explain how arm span and height are related in each case. How do you describe the relationship shown on the graph?

$s = h$ ↔ same

$y = x$



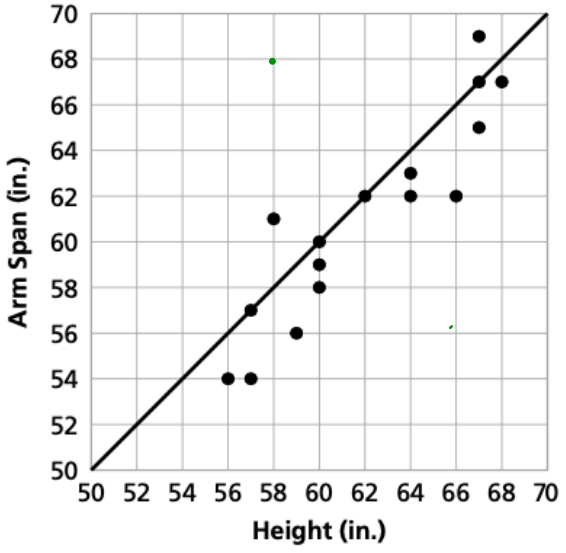
B The tallest person in recorded history was Robert Pershing Wadlow. At age 22, he was 8 feet 11.1 inches (272 cm) tall. His arm span was 9 feet 5.75 inches (289 cm).

Arm span larger than height.

1. Where would you plot the point (height, arm span) for Robert Wadlow? Would the point be *on*, *above*, or *below* the line you drew in Question A, part (3)?

Ht. 8'11"
Arm span 9'6"

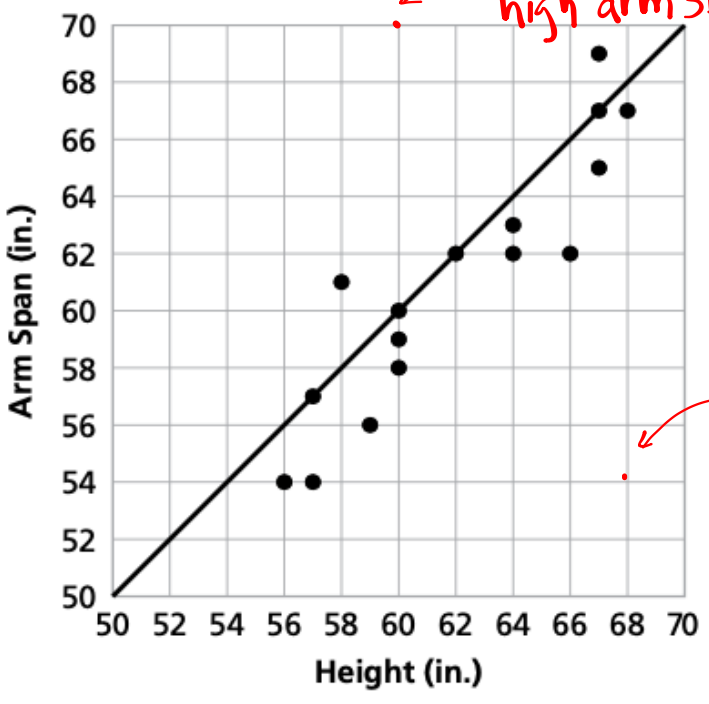
2. Does the data point for Robert Wadlow support the claim that arm span and height are roughly equal?



Problem 4.1 *continued*

D The dinosaur *Tyrannosaurus rex* grew to 20 feet in height with an arm span of about 10 feet.

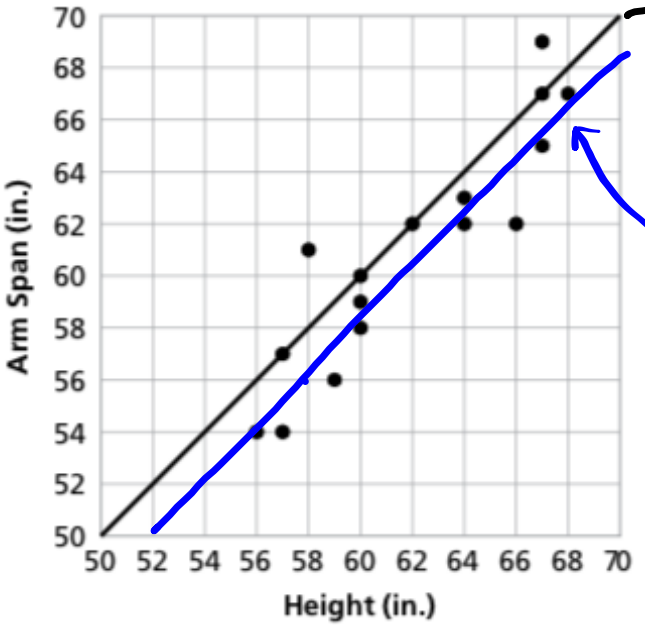
1. Do you think the *T. rex* data point fits the pattern that arm span and height are roughly equal? Explain.
2. If you plot the data point, would it be *on*, *above*, or *below* the line you drew in Question A, part (3)?



low height
high arm span

Big height
low arm span

(20 ft, 10 ft)



s = h

line of best fit

most people are actually taller than arm span

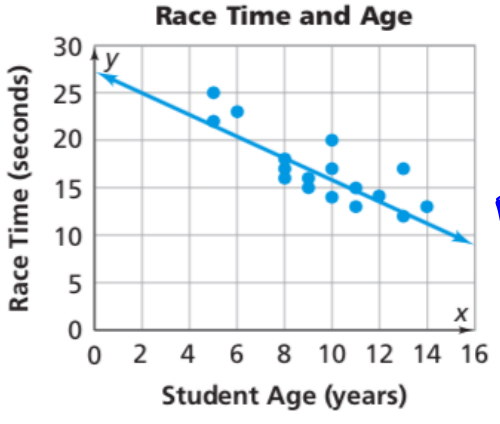
4.2 Older and Faster

Negative Correlation

Magnolia Elementary is a school with students who are 5 to 14 years old. One field day, all students were timed in a 100-meter race. The table shows data for some of the students.

Student Age (years)	5	5	6	8	8	8	9	9	10	10	10	11	11	12	13	13	14
Race Time (seconds)	25	22	23	18	16	17	15	16	17	20	14	15	13	14	17	12	13

The graph below shows the data from the table and a line that models the data.



Pretty strong relationship points are close to the LoBF

- How would you describe the relationship between age and race time?
- Would you say the relationship is *strong* or *weak*?
- Are the data points close to the line or spread out?

younger people are slower

Problem 4.2

No B3

Use the Race Time and Age graph.

A The line drawn on the graph models the relationship between age and race time.

1. What is the approximate slope of the line? $\frac{-5}{4} = -1.25$
2. How does the slope help you understand the relationship between age and race time? For every year older you get 1.25 s. faster
3. Do you think it makes sense to predict a race time for a 7-year-old student using the line? If so, what do you predict for a 7-year-old? How confident are you in your prediction?
4. Do you think it makes sense to predict a race time for a 21-year-old person using the line? If so, what do you predict for a 21-year-old? How confident are you in your prediction?

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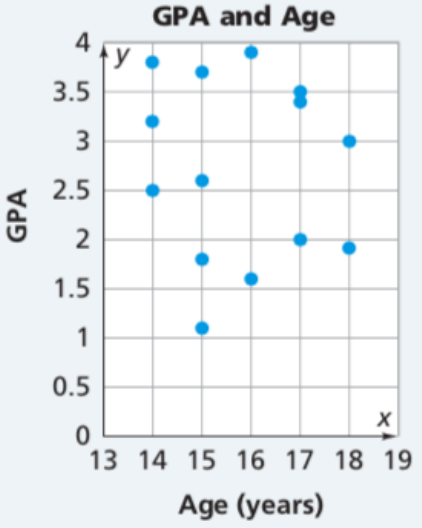
Problem 4.2 continued No B3

B Some data points are very close to the line while others are far from it. The points far from the line don't seem to fit the model.

1. Find two points that don't seem to fit the model. What are their coordinates (age, race time)?
2. Why do you think the points don't match the overall pattern? Explain. Think about the relationship between race time and age.
3. In Problem 4.1, you used a line to model (height, arm span).
   a. If a 6-foot-9-inch NBA basketball player has a 7-foot-5-inch arm span, would that data point fit the model?
   b. Would you plot the data point, *on*, *above*, or *below* the $s = h$ line? Explain.

C The table and graph show age and grade point average (GPA) for 14 students at Magnolia High School.

Student Age (years)	14	14	14	15	15	15	15	16	16	17	17	17	18	18
GPA	2.5	3.2	3.8	1.8	2.6	3.7	1.2	1.6	3.9	2.0	3.4	3.5	1.9	3.0



1. Are age and GPA strongly related for these students? Explain.
2. How is your answer to part (1) supported by the table?
3. How is your answer to part (1) supported by the scatter plot?

Homework

Finish classwork