

August 25, 2015

2 Variable Statistics Test Review

5.ID.5 Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.

5.ID.6 Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

5.ID.6a Fit a function to the data; use functions fitted to data to solve problems in the context of the data; use given functions or choose a function suggested by the context. Emphasize linear and exponential models.

5.ID.6b Informally assess the fit of a function by plotting and analyzing residuals.

5.ID.6c Fit a linear function for a scatter plot that suggests a linear association.

Feb 1-6:20 PM

COAL - Homework
Residuals

Name _____

Andrew recorded how many gallons of gas he filled his truck with and the number of miles he was able to drive. He believes the function $y = 22x$ would provide him with a good estimate of how many miles he will be able to drive. Analyze the data by looking at the residual plot to determine if the function is a good predictor.

$y = 22x$

Gallons	Miles Driven	x	Predicted Miles Driven	x	Residual
15	313	15	$22(15) = 330$	15	$313 - 330 = -17$
17	340	17	$22(17) = 374$	17	$340 - 374 = -34$
18	401	18	$22(18) = 396$	18	$401 - 396 = 5$
19	423	19	$22(19) = 418$	19	$423 - 418 = 5$
18	392	18	$22(18) = 396$	18	$392 - 396 = -4$
17	379	17	$22(17) = 374$	17	$379 - 374 = 5$
20	409	20	$22(20) = 440$	20	$409 - 440 = -31$
19	437	19	$22(19) = 418$	19	$437 - 418 = 19$
16	366	16	$22(16) = 352$	16	$366 - 352 = 14$
20	416	20	$22(20) = 440$	20	$416 - 440 = -24$

Residual Plot

Interpret The line $y = 22x$ is a good fit to estimate how many miles Andrew can drive based on the number of gallons of gas because there is no clear pattern.

Feb 18-9:45 AM

Match the following.

1. Scatter Plot	a. Displays two categorical variables
2. Dot Plot	b. Groups quantitative data into ranges
3. Histogram	c. Displays data in 4 equal parts
4. Two-Way Frequency Table	d. Displays two quantitative variables
5. Box and Whiskers Plot	e. Displays every data point in a set

Match the following variables with the correct representation.

6. weight of puppies	a. scatter plot
7. Number of absences and grade in class	b. histogram
8. type of car and state	c. two-way frequency table

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Match the following.

<u>d</u> 1. Scatter Plot	a. Displays two categorical variables
<u>e</u> 2. Dot Plot	b. Groups quantitative data into ranges
<u>b</u> 3. Histogram	c. Displays data in 4 equal parts
<u>a</u> 4. Two-Way Frequency Table	d. Displays two quantitative variables
<u>c</u> 5. Box and Whiskers Plot	e. Displays every data point in a set

Match the following variables with the correct representation.

<u>b</u> 6. weight of puppies	a. scatter plot
<u>a</u> 7. Number of absences and grade in class	b. histogram
<u>c</u> 8. type of car and state	c. two-way frequency table

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For each graph, decide if a line of best fit is appropriate.

9. 10. 11. 12. 13. 14.

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For each graph, decide if a line of best fit is appropriate.

9. yes; linear 10. no; not linear 11. no; not linear

Determine if each residual plot supports that the line of best fit is a good predictor.

12. no; pattern 13. yes; randomly scattered 14. no; pattern

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Based on the table below, answer the following questions.

Grade	Transportation to School			Total
	Bus	Parent	Friend	
Freshmen	38	12	2	52
Sophomore	21	25	8	54
Junior	11	18	20	49
Total	70	55	30	155

- Find the relative frequency of students who are Sophomores and ride the bus.
- Find the relative frequency of students who ride with a friend.
- Find the conditional relative frequency of students who ride with a parent given they are Freshmen.
- Find the conditional relative frequency of students who are Juniors, given they ride the bus.

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Based on the table below, answer the following questions.

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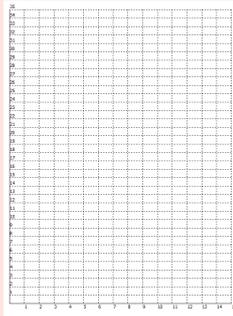
- Find the relative frequency of students who are Sophomores and ride the bus.
 $\frac{21}{155} = .135 = 13.5\%$
- Find the relative frequency of students who ride with a friend.
 $\frac{30}{155} = .194 = 19.4\%$
- Find the conditional relative frequency of students who ride with a parent given they are Freshmen.
 $\frac{12}{52} = .231 = 23.1\%$
- Find the conditional relative frequency of students who are Juniors, given they ride the bus.
 $\frac{11}{70} = .157 = 15.7\%$

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19. The following data shows the length of a baby given his/her age in months.

Age in Months	Height in Inches
1	20
3	23
6	27
8	27.5
9	31
12	32
15	34

a. Draw a scatter plot.



b. Explain which function fits the data.

$y = \frac{1}{4}x + 20$ or $y = x + 20$

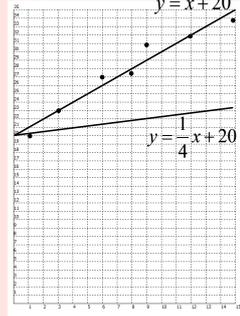
x	y	x	y

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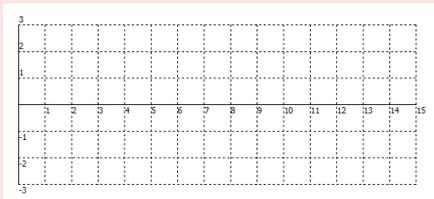
x	y	x	y

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c. Determine if the equation you chose is a good predictor by calculating and plotting the residuals.

Age in Months	Predicted Height
1	
3	
6	
8	
9	
12	
15	

Age in Months	Residuals
1	
3	
6	
8	
9	
12	
15	



Interpret

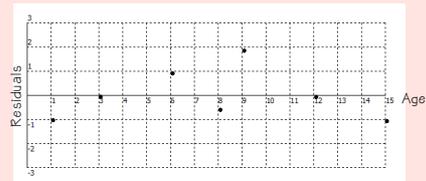
d. If the line is a good predictor, how old will the child be when he/she is 42 inches tall?

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c. Determine if the equation you chose is a good predictor by calculating and plotting the residuals.

Age in Months	Predicted Height
1	21
3	23
6	26
8	28
9	29
12	32
15	35

Age in Months	Residuals
1	-1
3	0
6	1
8	-0.5
9	2
12	0
15	-1



Interpret

There is no clear pattern in the residuals, so the line of best fit $y = x + 20$ is appropriate for the data.

d. If the line is a good predictor, how old will the child be when he/she is 42 inches tall?

$42 = x + 20$

$x = 22$ months

The child will be approximately 22 months old when he/she is 42 inches tall.

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20. Write the equation of the line of best fit below.

Week	Weight in Pounds
1	193
2	190
3	191.4
4	188.5
5	189
6	188.6
7	185
8	182
9	177.8

Equation _____

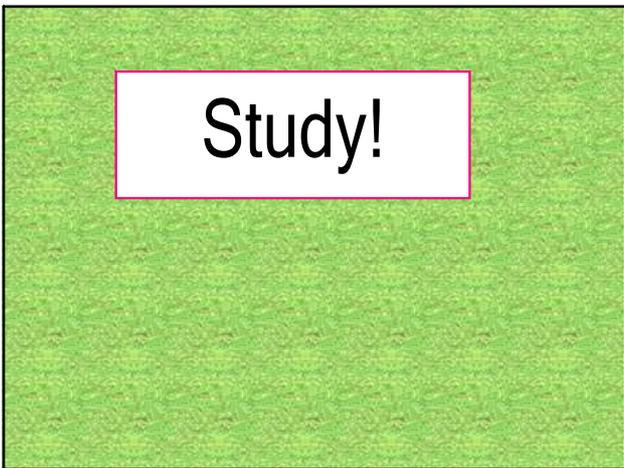
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20. Write the equation of the line of best fit below.

Week	Weight in Pounds
1	193
2	190
3	191.4
4	188.5
5	189
6	188.6
7	185
8	182
9	177.8

Equation $y = -\frac{11}{7}x + 194.6$

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