


TWO WAY TABLES

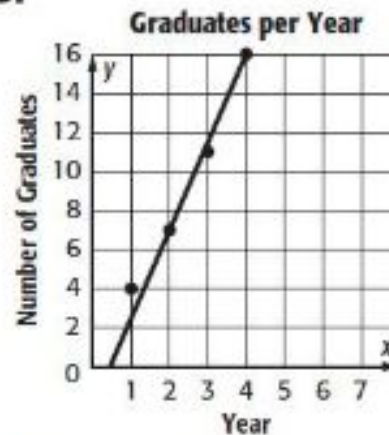
Chapter 9
Lesson 3



The table below shows the test scores for students who studied different amounts of time.

Study Time (minutes)	15	35	20	45	50	60	30	40
Test Score (points)	76	85	82	93	97	100	89	91

1. Construct a scatter plot of the data. Then draw a line that seems to best represent the data.
2. Use the line of best fit to predict the test score for a student who studied 25 minutes.
3.  **TEST PRACTICE** The scatter plot shows the number of graduates of a computer program. Which equation represents the line that is drawn?



A. $y = 4.5x + 16$

B. $y = 4.5x - 2$

C. $y = 4.5x + 2$


D. $y = 4.5x - 16$

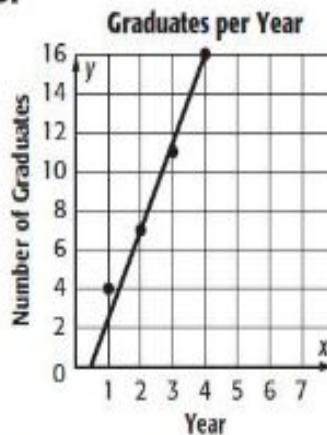


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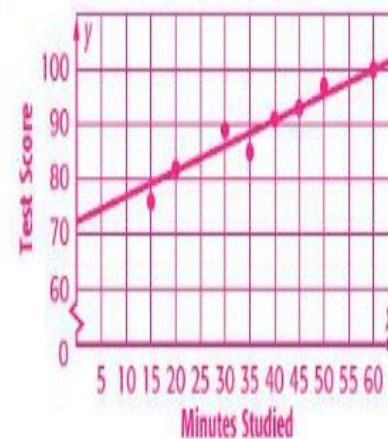
ANSWERS

1.

Study Time and Test Scores

2. 84

3. B



OBJECTIVE

- Students will be able to construct two way tables and interpret relative frequencies.

VOCABULARY

Relative Frequency -

Is the ratio of the value of a subtotal to the value of the total.

Two Way Table -

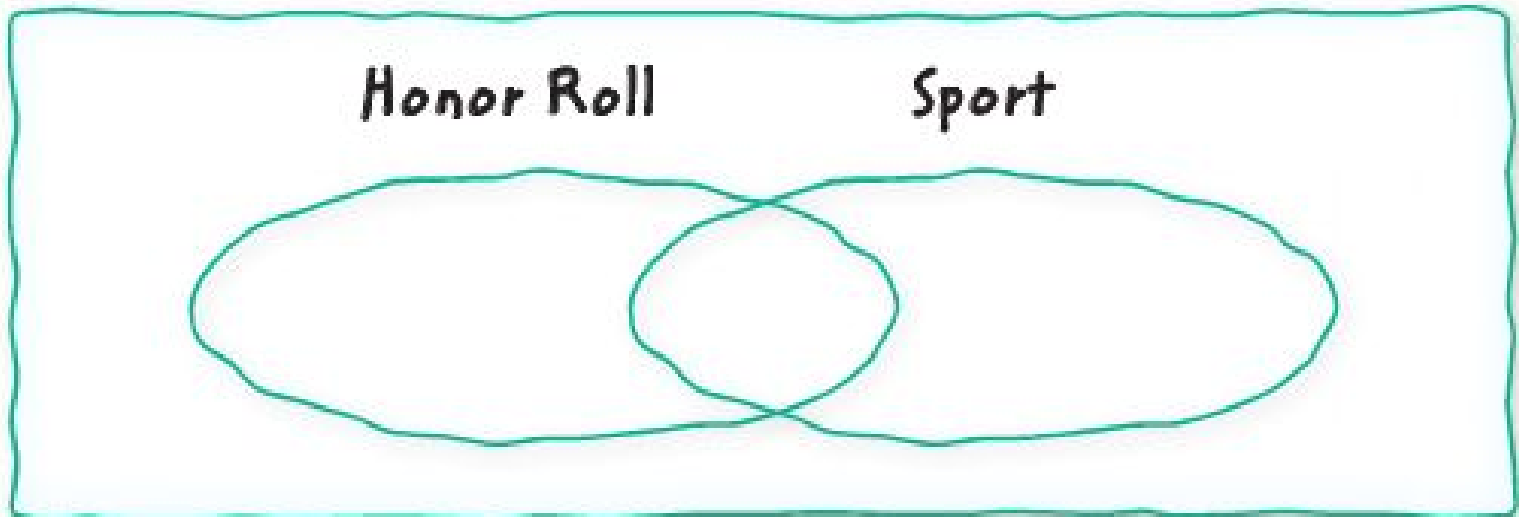
Shows data from one sample group as it relates to two different categories.

Complete the Venn Diagram -- how many students will not be represented on the Venn Diagram?

Student Athletes The data from a survey of 440 students are shown in the table. The students were asked whether or not they were on the honor roll and whether or not they played a sport.

Student Athlete Survey	
Only on the honor roll	115
Only play a sport	45
Play a sport and are on the honor roll	250

1. Complete the Venn diagram to represent the data.



RELATIVE FREQUENCY?

Student Athlete Survey	
Only on the honor roll	115
Only play a sport	45
Play a sport and are on the honor roll	250

What is the **RELATIVE FREQUENCY** of a student on the honor roll and plays a sport to all the students who are on the honor roll?

Remember what relative frequency is and then use your data to calculate.

Answer on next screen :

Answer

$250/365 = .685$ (rounded to closest thousandth) or 68.5% of all students who are on the honor roll play a sport.

What does that tell you?

Student Athlete Survey	
Only on the honor roll	115
Only play a sport	45
Play a sport and are on the honor roll	250

CONSTRUCT A TWO-WAY TABLE

A **two-way table** shows data from one sample group as it relates to two different categories.

The same information from the Venn diagram on the previous page is shown below as a two-way table, where one category is represented by rows and the other category is represented by columns. The two categories in the table shown are “Play a Sport” and “On the Honor Roll.”

	Play a Sport	Do Not Play a Sport	Total
On the Honor Roll	250	115	365
Not On the Honor Roll	45	30	75
Total	$250 + 45 = 295$	$115 + 30$ or 145	440

VIDEO:

http://www.teachertube.com/viewVideo.php?video_id=288912

Try this one!

There are 150 children at summer camp and 71 signed up for swimming. There were a total of 62 children that signed up for canoeing and 28 of them also signed up for swimming. Construct a two-way table summarizing the data.

	Canoeing	No Canoeing	Total
Swimming			
No Swimming			
Total			



ANSWER

	Canoeing	No Canoeing	Total
Swimming	28	43	71
No Swimming	34	45	79
Total	62	88	150



INTERPRET RELATIVE FREQUENCIES

Interpret Relative Frequencies

A two-way table can show relative frequencies for rows or for columns, rather than the actual values. By analyzing the relative frequencies in a two-way table, you can determine possible associations between the two variables.

**What are the key words in this definition?
When did we do this in this lesson?**

Find Relative Frequency

Find and interpret the relative frequencies of students in the survey from Example 1 by row.

	MP3 Player	No MP3 Player	Total
Cell Phone	57	21	78
No Cell Phone	13	9	22
Total	70	30	100

To find the relative frequencies by row, write the ratios of each value to the total in that row. Round to the nearest hundredth.

survey from **Example 1** by row.

	MP3 Player	No MP3 Player	Total
Cell Phone	57	21	78
No Cell Phone	13	9	22
Total	70	30	100

To find the relative frequencies by row, write the ratios of each value to the total in that row. Round to the nearest hundredth.

	MP3 Player	No MP3 Player	Total
Cell Phone	$57; \frac{57}{78} \approx 0.73$	$21; \frac{21}{78} \approx 0.27$	78; 1.00
No Cell Phone	$13; \frac{13}{22} \approx 0.59$	$9; \frac{9}{22} \approx 0.41$	22; 1.00

Only the totals needed are shown in the table.


Based on the relative frequency value of 0.73 in one of the cells, you can imply that most students that own a cell phone also own an MP3 player. The data also suggest that over half of the students that do not own a cell phone will own an MP3 player.

Try One :)

Got It? Do this problem to find out.

- b. Find and interpret the relative frequencies of students in the survey by column. Round to the nearest hundredth if necessary.

	MP3 Player	No MP3 Player
Cell Phone	57;	21;
No Cell Phone	13;	9;
Total	70;	30;



Was this your answer?




- b. **Sample answer:**
The relative frequency value of 0.81 in one of the cells strongly suggests that most students that own an MP3 player also own a cell phone.

Got It? Do this problem to find out.

- b. Find and interpret the relative frequencies of students in the survey by column. Round to the nearest hundredth if necessary.

	MP3 Player	No MP3 Player
Cell Phone	57; $\frac{57}{70} \approx 0.81$	21; $\frac{21}{30} \approx 0.70$
No Cell Phone	13; $\frac{13}{70} \approx 0.19$	9; $\frac{9}{30} \approx 0.30$
Total	70; 1.00	30; 1.00



Think About It:

What conclusions can you make from analyzing and interpreting relative frequencies?

How do you know if there is a correlation between the data?

Are there any rules you could create?

How did what you learned today help you answer the



Essential Question

How are patterns used when comparing two quantities?

Sample answers:

- You can analyze information about a group by constructing a two-way table.**
- By examining the relative frequencies, you can determine possible associations between two different categories from the same group.**

TICKET

Out the Door

How can you use a Venn diagram to construct a two-way table?

HOMEWORK

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