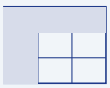
Two-Way Frequency Tables

Name: _____	Date: _____	Score: _____ / 30

Quick Review and Helpful Hints

A *two-way table* records counts for two categories at once. Each row and column has a *total* (marginal total), and the *grand total* is the sum of all the inner cells. Read a cell by matching its row and column; a relative frequency divides a cell by a total.

▷ **Example:** In a survey, 8 boys and 6 girls like soccer. How many like soccer in all? **Work:** Add the two counts in the soccer column: $8 + 6$. ★ **Answer:** 14



Rows, columns, and totals.

Practice Problems

Use this table – Boys: soccer 8, basketball 12 (total 20); Girls: soccer 6, basketball 4 (total 10); column totals soccer 14, basketball 16, grand total 30.

1. Boys who like soccer _____
2. Girls who like basketball _____
3. Total number of boys _____
4. Total number of girls _____
5. Total who like soccer _____
6. Total who like basketball _____
7. Grand total surveyed _____
8. Boys who like basketball _____
9. How many more boys than girls? _____
10. Fraction of all who like soccer _____
11. Fraction of all who are boys _____
12. Total girls who chose a sport _____
13. Of the boys, how many like basketball? _____
14. How many more like basketball than soccer? _____

Word Problems

15. Using the table, how many students were surveyed in all? _____
16. How many students like soccer? _____
17. What fraction of all the students are girls? _____
18. How many boys like basketball? _____

Illustrated Practice

Use each two-way table. Match the row and column first, then use totals if needed.

	Art	Rob.	T
Boys	7	13	20
Girls	11	9	20

19. How many girls chose Robotics?

_____

	Art	Rob.	T
Boys	7	13	20
Girls	11	9	20

20. What is the Art column total?

_____

	Art	Rob.	T
Boys	7	13	20
Girls	11	9	20

21. What is the Boys row total?

_____

	Art	Rob.	T
Boys	7	13	20
Girls	11	9	20
		grand	

22. What is the grand total?

_____

	Art	Rob.	T
Boys	7	13	20
Girls	11	9	20

23. What fraction of girls chose Art?

_____

	Art	Rob.	T
Boys	7	13	20
Girls	11	9	20

24. How many more chose Robotics than Art?

_____

	Pass	Rev	T
AM	24	11	35
PM	18	7	25

25. How many students passed in all?

_____

	Pass	Rev	T
AM	24	11	35
PM	18	7	25

26. What is the PM row total?

_____

	Pass	Rev	T
AM	24	11	35
PM	18	7	25

27. What fraction of all students passed?

_____

	BB	Soccer	T
Boys	14	6	20
Girls	11	9	20

28. How many boys chose basketball?

_____

	BB	Soccer	T
Boys	14	6	20
Girls	11	9	20

29. What is the Girls row total?

_____

	BB	Soccer	T
Boys	14	6	20
Girls	11	9	20

30. What is the Soccer column total?

_____

Answer Keys

1. $\boxed{8}$	**11.** $\boxed{\frac{2}{3}}$	**21.** $\boxed{20}$
2. $\boxed{4}$	**12.** $\boxed{10}$	**22.** $\boxed{40}$
3. $\boxed{20}$	**13.** $\boxed{12}$	**23.** $\boxed{\frac{11}{20}}$
4. $\boxed{10}$	**14.** $\boxed{2}$	**24.** $\boxed{4}$
5. $\boxed{14}$	**15.** $\boxed{30}$	**25.** $\boxed{42}$
6. $\boxed{16}$	**16.** $\boxed{14}$	**26.** $\boxed{25}$
7. $\boxed{30}$	**17.** $\boxed{\frac{1}{3}}$	**27.** $\boxed{\frac{7}{10}}$
8. $\boxed{12}$	**18.** $\boxed{12}$	**28.** $\boxed{14}$
9. $\boxed{10}$	**19.** $\boxed{9}$	**29.** $\boxed{20}$
10. $\boxed{\frac{7}{15}}$	**20.** $\boxed{18}$	**30.** $\boxed{15}$

Step-by-Step Explanations

1. Start by naming the process: Read the correct row and column first, then use row totals, column totals, or the grand total as needed. The setup/work is Read the Boys row, Soccer column: 8. So the final answer is 8.

2. A good way to think about this is: Read the correct row and column first, then use row totals, column totals, or the grand total as needed. The setup/work is Read the Girls row, Basketball column: 4. So the final answer is 4.

3. Step by step: Read the correct row and column first, then use row totals, column totals, or the grand total as needed. The setup/work is The Boys row total is 20. So the final answer is 20.

4. Take it one move at a time: Read the correct row and column first, then use row totals, column totals, or the grand total as needed. The setup/work is The Girls row total is 10. So the final answer is 10.

5. Start by naming the process: Read the correct row and column first, then use row totals, column totals, or the grand total as needed. The setup/work is The Soccer column total is 14. So the final answer is 14.

6. A good way to think about this is: Read the correct row and column first, then use row totals, column totals, or the grand total as needed. The setup/work is The Basketball column total is 16. So the final answer is 16.

7. Step by step: Read the correct row and column first, then use row totals, column totals, or the grand total as needed. The setup/work is The grand total is 30. So the final answer is 30.

8. Take it one move at a time: Read the correct row and column first, then use row totals, column totals, or the grand total as needed. The setup/work is Boys row, Basketball column: 12. So the final answer is 12.

9. Start by naming the process: Read the correct row and column first, then use row totals, column totals, or the grand total as needed. The setup/work is $20 - 10 = 10$. So the final answer is 10.

10. A good way to think about this is: Read the correct row and column first, then use row totals, column totals, or the grand total as needed. The setup/work is $\frac{14}{30} = \frac{7}{15}$. So the final answer is $\frac{7}{15}$.

11. Step by step: Read the correct row and column first, then use row totals, column totals, or the grand total as needed. The setup/work is $\frac{20}{30} = \frac{2}{3}$. So the final answer is $\frac{2}{3}$.

12. Take it one move at a time: Read the correct row and column first, then use row totals, column totals, or the grand total as needed. The setup/work is Girls: $6 + 4 = 10$. So the final answer is 10.

13. Start by naming the process: Read the correct row and column first, then use row totals, column totals, or the grand total as needed. The setup/work is Boys row, Basketball column: 12. So the final answer is 12.

14. A good way to think about this is: Read the correct row and column first, then use row totals, column totals, or the grand total as needed. The setup/work is $16 - 14 = 2$. So the final answer is 2.

15. Step by step: Read the correct row and column first, then use row totals, column totals, or the grand total as needed. The setup/work is The grand total is 30. So the final answer is 30.

16. Take it one move at a time: Read the correct row and column first, then use row totals, column totals, or the grand total as needed. The setup/work is The Soccer column total is 14. So the final answer is 14.

17. Start by naming the process: Read the correct row and column first, then use row totals, column totals, or the grand total as needed. The setup/work is $\frac{10}{30} = \frac{1}{3}$. So the final answer is $\frac{1}{3}$.

18. A good way to think about this is: Read the correct row and column first, then use row totals, column totals, or the grand total as needed. The setup/work is Boys row, Basketball column: 12. So the final answer is 12.

19. Find the Girls row and Robotics column. The cell where they meet is 9, so 9 girls chose Robotics.

20. A column total adds the entries in that column. For Art, add boys and girls: $7 + 11 = 18$.

21. The Boys row total is shown at the end of the Boys row. It is 20.

22. The grand total is the total of everyone in the table. Add the row totals: $20 + 20 = 40$.

23. Use only the Girls row because the question says "of girls." There are 11 girls in Art out of 20 girls, so the fraction is $\frac{11}{20}$.

24. First find the column totals: Art is 18 and Robotics is 22. The difference is $22 - 18 = 4$.

25. The total passed is the sum of the Pass column. Add morning and evening: $24 + 18 = 42$.

26. The PM row total is the number at the end of the PM row. It is 25.

27. Use passed students over all students. There are 42 who passed out of 60 total, and $\frac{42}{60}$ simplifies to $\frac{7}{10}$.

28. Match the Boys row with the Basketball column. That cell is 14, so 14 boys chose basketball.

29. Read the total at the end of the Girls row. The row total is 20.

30. The Soccer column total adds boys and girls who chose soccer: $6+9 = 15$.

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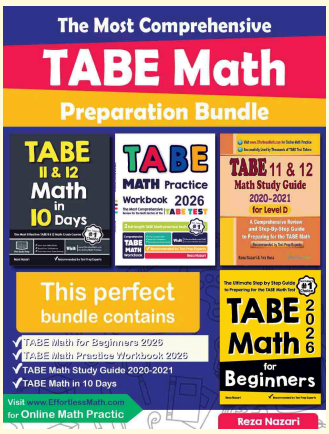

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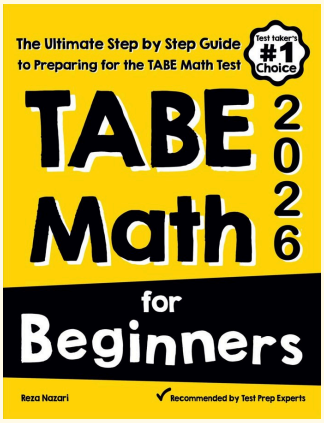

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