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PRACTICE 6 REAL-WORLD PROBLEMS: DATA AND PROBABILITY

SOLVE. SHOW YOUR WORK.

Example

In a test, Carl, Sarah, and Dinesh scored an average of 70 points. Carl scored 65 and Sarah scored 82. How many points did Dinesh get?

$$\begin{aligned}\text{Total score of the 3 students} &= 3 \times 70 \\ &= 210 \text{ points}\end{aligned}$$

$$\begin{aligned}\text{Carl and Sarah's total score} &= 65 + 82 \\ &= 147 \text{ points}\end{aligned}$$

$$\begin{aligned}\text{Dinesh's test score} &= 210 - 147 \\ &= 63 \text{ points}\end{aligned}$$

Dinesh's test score was 63 points.

1. Luis went on a fishing trip from Thursday to Sunday. On average, he caught 12 fish per day. He caught 15 fish on Thursday. How many fish did he catch altogether from Friday to Sunday? 33

$$4 \times 12 = 48$$

$$48 - 15 = 33$$

2.

Nicole bought 20 pieces of fabric of different lengths. The average length of 12 pieces is 3 feet. The total length of the other 8 pieces is 44 feet. Find the average length of the 20 pieces of fabric.

$$12 \times 3 = 36$$

$$\begin{array}{r} 44 \\ + 36 \\ \hline 80 \end{array}$$

$$\begin{array}{r} 4 \\ 20 \overline{) 80} \\ \underline{80} \\ 0 \end{array}$$

20 p

$$2 \times 36 = 72$$

$$72 + 44 = 116$$

3.

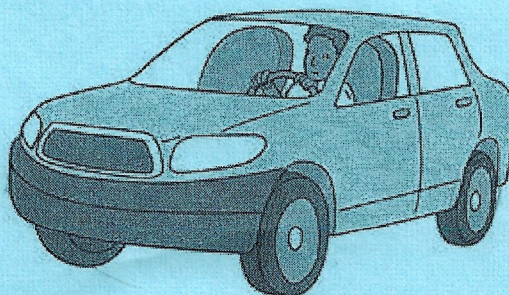
Ron drove his car every day from Monday to Saturday. On Monday and Tuesday, the car used an average of 2 gallons of gas each day. From Wednesday to Saturday, the car used an average of 3 gallons of gas each day. Find the total amount of gas the car used from Monday to Saturday.

$$2 \times 2 = 4$$

$$4 \times 3 = 12$$

$$4 \times 3 = 12 \text{ g}$$

$$4 + 12 = 16 \text{ g}$$



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SOLVE. SHOW YOUR WORK. USE BAR MODELS TO HELP YOU.*Example*

The average number of students in Class A and Class B is 24.

Class A has 4 more students than Class B.

How many students are there in each class?

Total number of students in both classes = $2 \times 24 = 48$

$$48 - 4 = 44$$

$$44 \div 2 = 22 \text{ students}$$

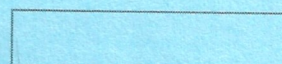
$$22 + 4 = 26 \text{ students}$$

Class A



48

Class B



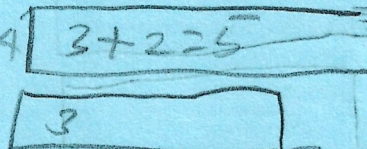
4

Class A has 26 students, and Class B has 22 students.**4.**

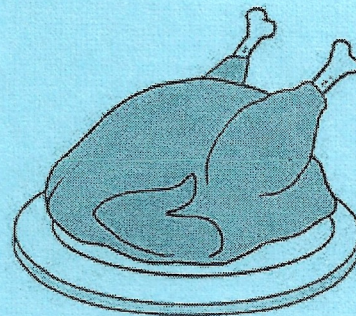
Mrs. Johnson buys 2 chickens. The average weight of the 2 chickens is 4 pounds. One of the chickens is 2 pounds heavier than the other. What is the weight of the heavier chicken?

$$4 \times 2 = 8$$

$$8 - 2 = 6$$

Chicken A
Chicken B

2



SOLVE. SHOW YOUR WORK.**Example**

A group of athletes took part in a charity marathon. The table shows the number of kilometers completed by each athlete.

RESULTS OF CHARITY MARATHON

NUMBER OF KILOMETERS COMPLETED BY EACH ATHLETE	NUMBER OF ATHLETES
42	4
36	1
28	3

Find the median.

28, 28, 28, 36, 42, 42, 42, 42

The median is $\frac{36 + 42}{2} = 39$ kilometers.

Find the mode.

28, 28, 28, 36, 42, 42, 42, 42

The mode is 42 kilometers.

Find the range.

The range is $42 - 28 = 14$ kilometers.

Find the mean.

$$4 \times 42 \text{ km} = 168 \text{ km}$$

$$1 \times 36 \text{ km} = 36 \text{ km}$$

$$3 \times 28 \text{ km} = 84 \text{ km}$$

$$\begin{aligned} \text{Total} &= 168 + 36 + 84 \\ &= 288 \text{ km} \end{aligned}$$

The mean is $288 \div 8 = 36$ kilometers.

Another athlete joins the charity marathon and completes 27 kilometers. Will this athlete's distance increase or decrease the mean? Explain why you think so. Then find the new mean number of kilometers completed by all the athletes.

The new athlete's distance will decrease the mean because this new data point is less than the old mean.

$$288 + 27 = 315 \text{ km}$$

$$315 \div 9 = 35 \text{ km}$$

The new mean is 35 kilometers.

For every kilometer each athlete completed, \$25 would be donated to charity. Find the amount of money raised for charity by the 9 athletes.

$$315 \times \$25 = \$7,875$$

The amount raised for charity is \$7,875.

5. The scores of 9 players playing 18 holes of golf are 65, 72, 70, 69, 72, 67, 70, 72, and 73.

- A. Find the median score. 70
 B. Find the mode of the scores. 72
 C. Find the range of the set of data. 8
 D. Find the mean of the set of data. 70

- E. Another player scores 80. Predict how this player's score will change the median, mode, range, and mean of the data and explain your reasoning. Then compute each of these measures to check your predictions.

median 71
 range 15
 mean 71
 mode 72

65, 67, 69, 70, 70, 72, 72, 73, 73
 630
 $630 \div 9 = 70$

$$\begin{array}{r} 6 \overline{) 630} \\ \underline{63} \\ 0 \end{array}$$

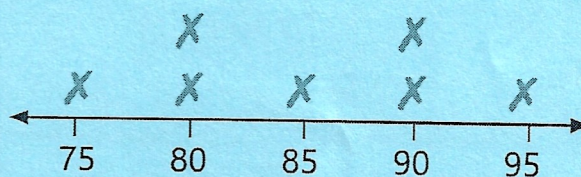
$$\begin{array}{r} 780 \\ -65 \\ \hline 15 \end{array}$$

$$210 \div 10 = 21$$

$$142 \div 2 = 71$$

Example

The line plot shows Marilyn's science test scores during one semester. Each **X** represents one test.



MARILYN'S SCIENCE TEST SCORES

- A.** How many tests did she take?

7

- B.** Find the median, mode, and range of her scores.

Marilyn's median score is 85.

Marilyn's modal scores are 80 and 90.

The range of her scores is $95 - 75 = 20$.

- C.** Find her mean score.

$$1 \times 75 = 75$$

$$2 \times 80 = 160$$

$$1 \times 85 = 85$$

$$2 \times 90 = 180$$

$$1 \times 95 = 95$$

$$\text{Total} = 595$$

$$595 \div 7 = 85$$

Her mean score is 85.

- D.** After Marilyn took another test, her new mean score was 84. What was her latest score?

$$84 \times 8 = 672$$

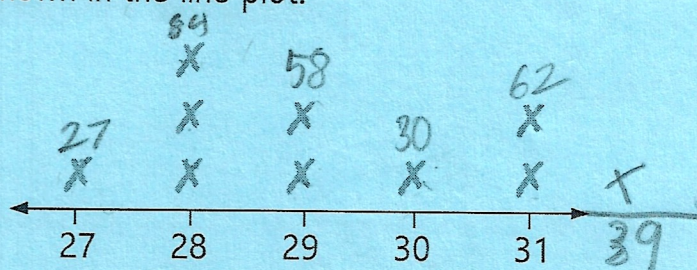
$$672 - 595 = 77$$

Her latest score was 77.

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6. Kurt recorded the daily temperature highs for a science project. The results are shown in the line plot.



DAILY TEMPERATURE HIGHS IN °F

- A. On how many days did he record the temperature? 9

- B. What were the mean and median temperatures?

mean = 24, median = 29

$$27 + 84 + 58 + 30 + 62 = 261$$

$$261 \div 9 = 29$$

mean 24

- C. The temperature high on another day was included with the data. The new mean temperature changed to 30°F. What was this temperature?

$$\begin{array}{r} 30 \times 10 = 300 \\ 2780 \\ - 261 \\ \hline 039 \end{array}$$

- D. Find the new median temperature.

$$\begin{array}{r} 29 \\ + 29 \\ \hline 58 \end{array} \quad \begin{array}{r} 29 \\ 29 \\ 29 \\ 29 \\ 29 \\ 29 \\ 29 \\ 29 \\ 29 \\ 29 \\ \hline 290 \end{array}$$

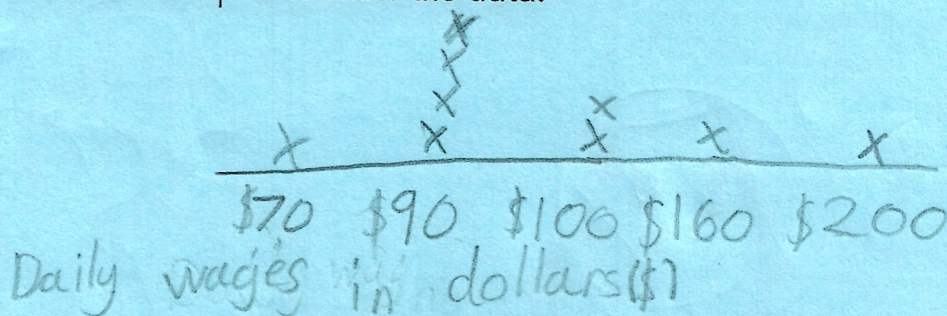
$$27 - 28 - 28 - 28 - 29 - 29 - 30 - 31 - 31 - 31 - 31$$

7.

A restaurant pays its 9 employees these daily wages:

\$90, \$70, \$100, \$90, \$90, \$90, \$100, \$160, \$200 = 990

Make a line plot to show the data.



- A. Find the mean and median of the set of wages.

$$990 \div 9 = 110$$

$$\text{Mean} = 110 \quad \text{Median} = 90$$

- B. Does the mean or the median better describe what a new employee could expect to earn at this restaurant? median

- C. Are there any outliers? If so, what are they? 200

- D. How do the mean and median each change if you disregard the outliers? Now does the mean or median better represent what a new employee could expect to earn? median

$$\begin{array}{r} 990 \\ -200 \\ \hline 790 \end{array}$$

$$\begin{array}{r} 098.75 \\ 8 \overline{) 790} \\ \underline{72} \\ 070 \\ \underline{64} \\ 060 \\ \underline{56} \\ 040 \\ \underline{40} \\ \hline 00 \end{array}$$

$$\begin{array}{l} \text{mean} = \$98.75 \\ \text{median} = \$90 \end{array}$$