Mastery in Statistics

Connections and Reasoning

Three positive integers have a mean average of 7 and a range of 11.

List all the sets of numbers that satisfy these conditions.

The mean average of some numbers is 3. What happens to the mean average if all of the numbers are multiplied by 2?

The range of some numbers is 5. What happens to the range if all of the numbers are increased by 2?

Find four numbers which have a mean average of 3, a range of 6 and a mode of 2.

Problem Solving

In a set of three integers, the first is double the value of the second and the second is double the value of the third. The mean average of the three integers is 14. Find the values of the integers.

Over their first four games, the mean average number of goals scored by a football team is 3. After the fifth game, the mean average number of goals scored rises to 4. How many goals were scored during the fifth game?

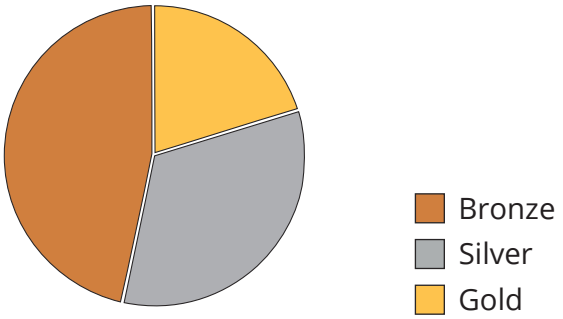
The mean average of five numbers is 7. If one of the numbers is 11, what is the mean average of the remaining four numbers?

Connections and Reasoning

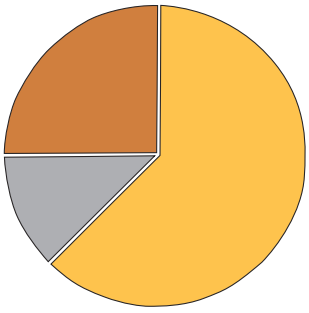
Calculate the mean average of $\frac{3}{5}$ and $\frac{2}{15}$. Give your answer in its simplest form.

The pie charts show the proportion of gold, silver and bronze medals won by a hockey team at the Olympics. Bella says, "The pie charts show that the team won more gold medals in 2016 than in 2012." Is she right? Explain your answer.

Medals Won in 2012



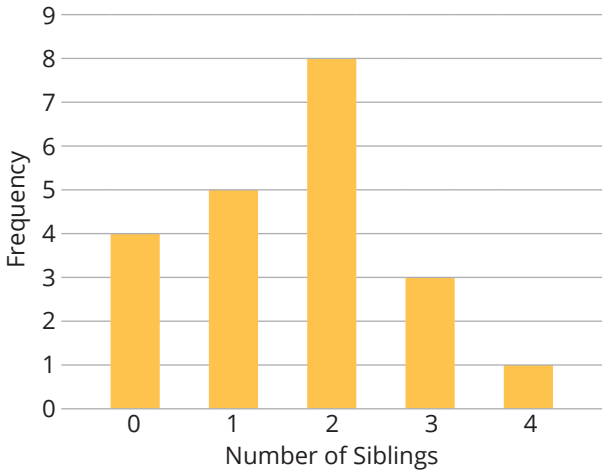
Medals Won in 2016



Problem Solving

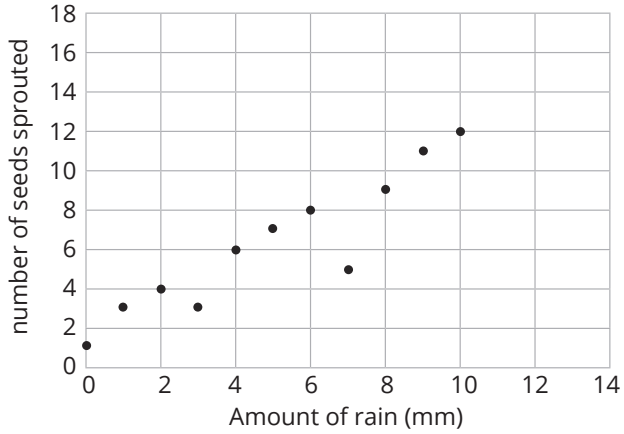
The mean of three numbers a, b and c is a. What is the mean of b and c?

Alex asks the students in his class how many younger siblings they each have. His results are displayed in the bar chart below. What is the mean average number of younger siblings? Give your answer correct to 1 decimal place.



Connections and Reasoning

The scatter graph shows the results of an experiment to compare the overall rainfall with the number of seeds out of 30 which successfully sprouted when planted.



Prakash says that 12mm of rain would yield 14 seedlings. Is this a reliable estimate?

Mastery in Statistics **Answers**

Connections and Reasoning

Three positive integers have a mean average of 7 and a range of 11.

List all the sets of numbers that satisfy these conditions.

The numbers must sum to 7 × 3 = 21

1, 8, 12

2, 6, 13

3, 4, 14

There are no other sets of numbers that satisfy the conditions.

The mean average of some numbers is 3. What happens to the mean average if all of the numbers are multiplied by 2?

The mean is also multiplied by 2.

The range of some numbers is 5. What happens to the range if all of the numbers are increased by 2?

The range will stay the same.

Find four numbers which have a mean average of 3, a range of 6 and a mode of 2.

3 × 4 = 12

There must be at least two numbers which are 2.

The numbers are 1, 2, 2, 7

Problem Solving

In a set of three integers, the first is double the value of the second and the second is double the value of the third. The mean average of the three integers is 14. Find the values of the integers.

$\frac{4x + 2x + x}{3} = 14$

$7x = 42$

$x = 6$

The integers are 24, 12 and 6.

Over their first four games, the mean average number of goals scored by a football team is 3. After the fifth game, the mean average number of goals scored rises to 4. How many goals were scored during the fifth game?

4 × 3 = 12

5 × 4 = 20

20 − 12 = 8 goals

The mean average of five numbers is 7. If one of the numbers is 11, what is the mean average of the remaining four numbers?

5 × 7 = 35

35 – 11 = 24

24 ÷ 4 = 6

Connections and Reasoning

Calculate the mean average of $\frac{3}{5}$ and $\frac{2}{15}$. Give your answer in its simplest form.

$\frac{3}{5} + \frac{2}{15} = \frac{9}{15} + \frac{2}{15}$

$= \frac{11}{15}$

$\frac{11}{15} \div 2 = \frac{11}{15} \times \frac{1}{2}$

$= \frac{11}{30}$

Problem Solving

The mean of three numbers a, b and c is a. What is the mean of b and c?

$\frac{a+b+c}{3} = a$

$a + b + c = 3a$

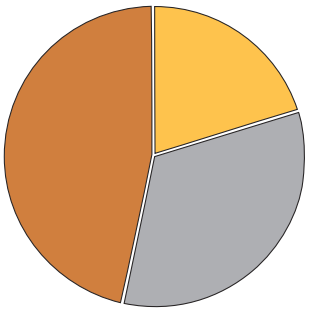
$b + c = 2a$

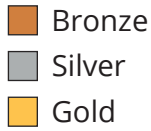
$\frac{b+c}{2} = a$

The mean is a.

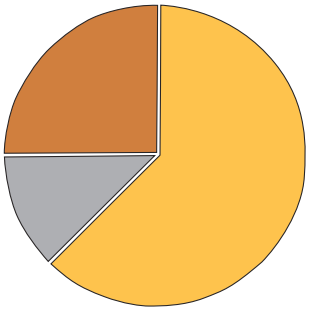
The pie charts show the proportion of gold, silver and bronze medals won by a hockey team at the Olympics. Bella says, "The pie charts show that the team won more gold medals in 2016 than in 2012." Is she right? Explain your answer.

Medals Won in 2012



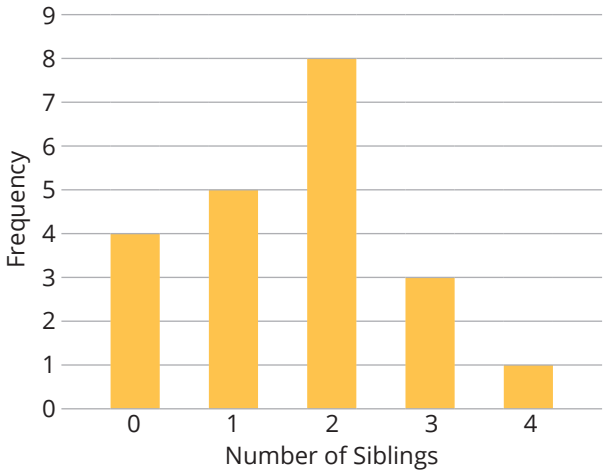


Medals Won in 2016



No. We don't know how many medals were won in total, so we cannot compare the numbers from each year.

Alex asks the students in his class how many younger siblings they each have. His results are displayed in the bar chart below. What is the mean average number of younger siblings? Give your answer correct to 1 decimal place.

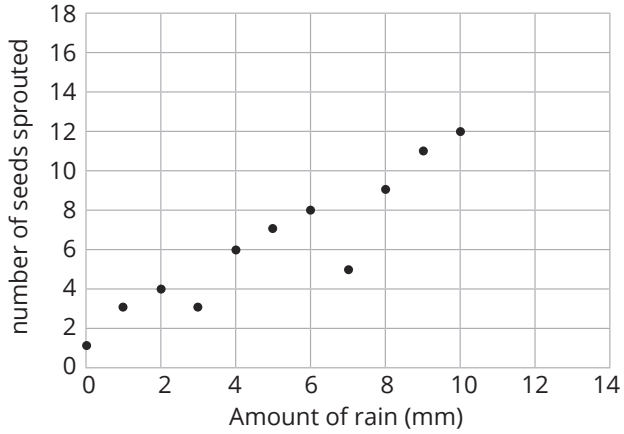


$(0 \times 4) + (1 \times 5) + (2 \times 8) + (3 \times 3) + (4 \times 1) = 34$

$34 \div 21 = 1.6$

Connections and Reasoning

The scatter graph shows the results of an experiment to compare the overall rainfall with the number of seeds out of 30 which successfully sprouted when planted.



Prakash says that 12mm of rain would yield 14 seedlings. Is this a reliable estimate?

Students should construct a line of best fit and extrapolate the result for 12mm, which gives 14 seedlings. However, this lies outside of the data we have been given so will be less reliable than an interpolated result.