

# SAMPLE PAGES FOR

## SOUTH CAROLINA 8TH GRADE MATHEMATICS

SECOND EDITION

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### CHALLENGE THE

**P**ALMETTO **A**CHIEVEMENT **C**HALLENGE **T**EST

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BY

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 MEAN, MEDIAN, MODE  
AND RANGE
➤ *Mean*

Mean is another word for average.

$$\text{Mean} = \frac{\text{all the numbers added together}}{\text{how many numbers you added}}$$

**EXAMPLES**

90, 80, 50, 70, 60

Find the mean.

$$\begin{array}{r} 90 \\ 80 \\ 50 \\ 70 \\ + 60 \\ \hline 350 \end{array}$$

Add the numbers.

Total

$$\frac{350}{5} = 70$$

Divide the total by 5.

70 is the mean.

25, 65, 35, 45, 95, 35

Find the mean.

$$\begin{array}{r} 25 \\ 65 \\ 35 \\ 45 \\ 95 \\ + 35 \\ \hline 300 \end{array}$$

Add the numbers.

Total

$$\frac{300}{6} = 50$$

Divide the total by 6.

50 is the mean.

Suppose you know the mean, but you are missing one of the numbers.

### EXAMPLES

85 = mean.

86, 83, 81, \_\_\_

Find the missing number.

You have 4 numbers that have a mean of 85. Multiply  $85 \times 4$  to get the total sum needed.

$$85 \times 4 = 340 \text{ (total sum)}$$

Add the 3 numbers that you know.

$$86 + 83 + 81 = 250 \text{ (sum you have)}$$

Now subtract the sum you have from the total sum to find your missing number.

$$340 - 250 = 90 \text{ (missing number)}$$

73 = mean.

75, 94, 32, 75, \_\_\_

Find the missing number.

Multiply the mean of 73 by 5 (numbers you have).

$$73 \times 5 = 365 \text{ (total sum)}$$

Add the numbers you are given.

$$75 + 94 + 32 + 75 = 276 \text{ (sum you have)}$$

Subtract the sum you have from the total sum to find your missing number.

$$365 - 276 = 89 \text{ (missing number)}$$

### PRACTICE

Find the mean of each set of numbers.

1. 3, 7, 10, 12

4. 50, 45, 35, 20, 10

2. 7, 8, 21, 32

5. 95, 85, 80, 75, 70, 60

3. 30, 40, 80, 90, 100

6. 35, 85, 25, 75, 15

7. 56, 65, 89, 100, 135

14. 60, 65, 70, 75

8. 35, 50, 50

15. 23, 12, 22, 33

9. 9, 12, 15, 17, 19

16. 1, 2, 3, 4, 5

10. 100, 100, 100, 75, 25

17. 50, 100, 50, 100

11. 200, 400, 800, 300

18. 1, 3, 5, 7, 9

12. 55, 95, 105

19. 1,000, 2,000, 3,000, 2,000

13. 5, 10, 15, 20, 25

20. 2, 4, 6, 8, 10

## PRACTICE

Find the missing data.

1. Mean = 37.  
40, 29, 50, ?

8. Mean = 31.  
63, 53, 20, 10, ?

15. Mean = 88.  
90, 80, 75, ?

2. Mean = 90.  
100, 95, 92, 85, ?

9. Mean = 100.  
300, 75, 100, 10, ?

16. Mean = 45.  
35, 75, ?

3. Mean = 40.  
50, 30, 75, 15, ?

10. Mean = 130.  
200, 100, 125, ?

17. Mean = 80.  
100, 100, 20, ?

4. Mean = 75.  
85, 60, 25, ?

11. Mean = 70.  
89, 34, 40, 23, ?

18. Mean = 20.  
50, 10, 5, 4, ?

5. Mean = 50.  
65, 80, 73, 30, ?

12. Mean = 91.  
100, 140, 60, 75, ?

19. Mean = 35.  
80, 20, 5, ?

6. Mean = 81.  
70, 93, 69, ?

13. Mean = 39.  
50, 10, 29, 13, ?

20. Mean = 70.  
80, 100, 30, ?

7. Mean = 25.  
10, 29, 37, 20, ?

14. Mean = 48.  
50, 60, 30, 21, ?

21. Mean = 35.  
29, 36, 47, ?

## ➤ Review

- How do you find the mean of these numbers? 10, 15, 14, 13
  - Add all the numbers together.
  - Add all the numbers together and divide by 4.
  - Add all the numbers together and divide by 10.
  - Divide all the numbers by 4.
- What is the mean of 50, 60, 110, 120, and 190?
  - 53
  - 530
  - 106
  - 424
- If the mean is 52, what is the missing number? 60, 34, 29, ?
  - 85
  - 208
  - 80
  - 75
- What expression shows how to find the mean of 75, 93, 65, 14, 125?
  - $\frac{75 + 93 + 65 + 14 + 125}{5}$
  - $5(75 + 93 + 65 + 14 + 125)$
  - $\frac{75 + 93 + 65 + 14 + 125}{5}$
  - $75 + 93 + 65 + 14 + 125$
- What is the first step in finding the missing data? Mean = 34. 29, 14, 83, ?
  - $\frac{34}{4}$
  - $\frac{29 + 14 + 83}{3}$
  - $29 + 14 + 83$
  - $34 \times 4$
- What is the second step in finding the mean of 10, 30, and 50?
  - $\times 3$
  - $10 + 30 + 50$
  - $90 - 3$
  - $\div 3$
- Find the mean of 220, 240, 280, 200.
  - 235
  - 940
  - 313
  - 470
- Find the missing data. Mean = 28. 71, 10, 6, 37, ?
  - 28
  - 124
  - 140
  - 16
- What is the first step in finding the mean of 1, 3, 7, 9?
  - $4 \times 4$
  - $1 + 3 + 7 + 9$
  - $\div 4$
  - $\frac{1 + 3 + 7 + 9}{4}$
- What expression shows how to find the mean of 50, 40, 30?
  - $\frac{3}{50 + 40 + 30}$
  - $3(50 + 40 + 30)$
  - $\frac{50 + 40 + 30}{3}$
  - $50 + 40 + 30$
- The mean of 25, 35, 45, 55, 65 is \_\_\_\_.
  - 45
  - 225
  - 5
  - 58

12. Is 25 the mean of 15, 30, 10?  
 a. yes  
 b. no
13. Mean = 57. 14, 80, 70, 15, ?  
 a. 80  
 b. 179  
 c. 285  
 d. 106
14. Mean = ?. 100, 10, 30, 40, 70  
 a. 10  
 b. 250  
 c. 40  
 d. 50
15. What is the first step in finding the missing data? Mean = 36. 17, 18, 89, 95, ?  
 a.  $17 + 18 + 89 + 95$   
 b.  $36 \times 5$   
 c.  $5 \div 36$   
 d.  $95 \times 5$
16. What is the mean of 5, 10, 15, 20, 10?  
 a. 60  
 b. 1.5  
 c. 12  
 d. 15
17. Marce's math scores were 80, 90, 100 and 78. What was the mean score?  
 a. 87  
 b. 80  
 c. 78  
 d. 95
18. John's mean spelling score is 93. He has scores of 100, 95, 93, 80, and \_\_\_\_\_. What is the missing score?  
 a. 87  
 b. 97  
 c. 90  
 d. 93
19. 40 = mean. 70, 30, 10, 50, 40, ?  
 a. 200  
 b. 240  
 c. 55  
 d. 40
20. What expression shows how to find the mean of 20, 60, 90?  
 a.  $(20 + 60 + 90)3$   
 b.  $\frac{20 + 60 + 90}{3}$   
 c.  $\frac{20 + 60}{90}$   
 d.  $\frac{20 \times 60 \times 90}{3}$
21. Find the mean of 100, 90, 10, 40.  
 a. 85  
 b. 25  
 c. 240  
 d. 60
22. 15 = mean. 25, 25, 5, 5, ?  
 a. 10  
 b. 60  
 c. 75  
 d. 15
23. Richard's puppies weighed 7 lbs., 8 lbs., 9 lbs., and 10 lbs. What is the mean weight?  
 a. 8 lbs  
 b. 9 lbs.  
 c. 8.5 lbs.  
 d. 9.5 lbs.
24. How did you solve number 23?  
 a.  $\frac{7 + 8 + 9 + 10}{4}$   
 b.  $4(7 + 8 + 9 + 10)$   
 c.  $7 + 8 + 9 + 10$   
 d.  $\frac{7 \times 8 \times 9 \times 10}{4}$

## ➤ *Median*

When a group of numbers is ordered from smallest to largest, the median is the middle number.

### EXAMPLES

Find the median.

50, 45, 30, 65, 21 (odd amount of numbers)

21, 30, 45, 50, 65 Order the numbers from smallest to largest.

45 is the median. Find the middle number.

Find the median.

25, 50, 60, 25, 70, 65 (even amount of numbers)

25, 25, 50, 60, 65, 70 Order the numbers.

$\frac{50 + 60}{2} = \frac{110}{2} = 55$  2 numbers are in the middle. Add the numbers and divide by 2 to get the median.

55 is the median.

## ➤ *Mode*

The number that appears the most often in a group is the mode.

### EXAMPLES

25, 69, 19, 25, 19, 25, 25

What is the mode of this group of numbers?

25 - 4 times

69 - 1 time

19 - 2 times

25 is the mode, because it appears the most often.

30, 40, 30, 40, 29, 13

What is the mode of this group of numbers?

30 - 2 times

40 - 2 times

29 - 1 time

13 - 1 time

30 and 40 are the modes, because they appear the most often.

## ➤ *Range*

Subtract the largest and the smallest numbers in a group of numbers to find the range.

### **EXAMPLE**

250, 190, 345, 117, 500, 300

What is the range of this group of numbers?

$$\begin{array}{r} 500 \quad (\text{largest number}) \\ -117 \quad (\text{smallest number}) \\ \hline 383 = \text{range} \end{array}$$

### **PRACTICE**

Find the median, mode and range.

1. 95.86, 75.88, 65.00, 35.25, 50.00, 86.45 \_\_\_\_\_

\_\_\_\_\_

2. 12, 3, 4, 8, 7, 8, 9, 10, 2

\_\_\_\_\_

3. 12, 16, 16, 19, 30, 16, 25

\_\_\_\_\_

4. 178, 176, 175, 178

\_\_\_\_\_

5. 200, 136, 145, 386, 110, 136, 400

\_\_\_\_\_

6. 90, 85, 83, 76, 83, 76

\_\_\_\_\_

7. 8, 7, 6, 1, 1, 3, 7

\_\_\_\_\_

\_\_\_\_\_

8. 60, 52, 41, 46, 43, 40, 38

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9. 9, 8, 1, 2, 2, 5, 8

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10. 9, 3, 6, 12, 15, 4, 9, 9, 2

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11. 986, 981, 986, 984

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12. 105, 116, 125, 78, 78

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13. 171, 178, 176, 175, 180

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14. 82, 85, 96, 92, 90, 85, 98

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15. 25, 40, 68, 85, 32, 90, 59, 85, 16, 79, 88, 25, 46

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## Review

- What is the first step in finding the median of 11, 3, 5, and 9?
  - Put in order from largest to smallest.
  - Put in order from smallest to largest.
  - Add the numbers together.
  - Add the numbers, divide by 4.
- What is the range of 15, 6, 4, 3, 1?
  - no range
  - 3
  - 14
  - 5.8
- What 2 numbers are in the middle of this set? 8, 3, 1, 6, 15, 7
  - 1, 6
  - 7, 8
  - 6, 7
  - 3, 1
- The mode of 50, 40, 30, 20, 20 is \_\_\_\_.
  - 20
  - 30
  - 32
  - 25
- What 2 numbers must you divide to find the median of 5, 10, 8, 3, 7, 6?
  - 3, 5
  - 8, 10
  - 5, 6
  - 6, 7
- What is the median of 80, 50, 40, 50?
  - 50
  - 45
  - 40
  - 55
- Mrs. Lowe went to two malls looking for purses. In 8 stores, the prices varied by \$19.25. Which measure did she use to get this data?
  - mean
  - median
  - mode
  - range
- Find the median. 20, 80, 70, 30, 15, 70, 30
  - 25
  - 30
  - 70
  - 45
- The most popular color in grade 7 is blue. What measure was used to determine this data?
  - mode
  - median
  - range
  - mean
- A basketball team had scores of 92, 75, 51, 48. What is the median score?
  - 85
  - 75
  - 63
  - 84
- Prices for apples were 89¢, 75¢, 78¢, 65¢, and 88¢ per pound. What is the median price?
  - 78¢
  - 75¢
  - 65¢
  - 79¢

12. What 2 numbers would be divided to find the median of these numbers?  
80, 25, 34, 95  
a. 95, 80  
b. 34, 80  
c. 25, 34  
d. 80, 25
13. Cars were priced at \$12,500, \$13,800, \$11,500, \$15,000, and \$14,100. What is the median price of the cars?  
a. \$13,380  
b. \$11,500  
c. \$12,500  
d. \$13,800
14. To ride a popular roller coaster, there must be a median weight of 120 pounds in each car. Will this group ride the roller coaster?  
Pounds: 125, 100, 75, 210, 145, 315  
a. No, their median weight is 129.  
b. No, their median weight is 135.  
c. Yes, their median weight is 125.  
d. No, their median weight is 119.
15. Arrange these numbers from smallest to largest. 15, 85, 24, 37, 15, 4  
a. 15, 85, 24, 37, 15, 4  
b. 85, 37, 24, 15, 15, 4  
c. 4, 15, 15, 24, 37, 85  
d. 15, 15, 24, 37, 4, 85
16. Arrange these numbers from largest to smallest. 75, 100, 36, 17, 15  
a. 15, 17, 36, 75, 100  
b. 75, 3, 17, 15, 100  
c. 100, 75, 36, 17, 15  
d. 36, 17, 15, 75, 100
17. If 80 and 90 were the two middle numbers, what would be the median?  
a. 80  
b. 85  
c. 90  
d. 170
18. Six bank tellers made these incomes last year: \$28,000, \$29,000, \$30,000, \$40,000, \$25,000, \$31,000. The bank tellers wanted a raise, so what measure would they use to convince their boss of their need for a raise?  
a. mean  
b. range  
c. mode  
d. median
19. If attendance for 5 days was 5,175, 6,932, 4,367, 7,136, and 4,800, what was the median attendance?  
a. 4,367  
b. 5,175  
c. 4,800  
d. 4,617
20. Arrange 25, 90, 36, 17, and 56 from smallest to largest.  
a. 17, 25, 36, 56, 90  
b. 90, 56, 25, 36, 17  
c. 90, 56, 36, 25, 17  
d. 17, 25, 56, 36, 90
21. Arrange the numbers in question 20 from largest to smallest.  
a. 17, 25, 36, 56, 90  
b. 90, 56, 25, 36, 17  
c. 90, 56, 36, 25, 17  
d. 17, 25, 56, 36, 90

22. What is the median price of these bananas? \$.96, \$.76, \$.86, \$.55, \$.49
- \$.54
  - \$.55
  - \$.76
  - \$.82
23. 70, 30, 40, 25 Which 2 numbers would you use to find the median?
- 70, 40
  - 25, 30
  - 25, 40
  - 30, 40
24. What is the range of these scores?  
80, 80, 70, 70, 60, 60
- 60
  - 80
  - 20
  - 65
25. Which set of numbers has a median of 80?
- 30, 20, 90, 40, 50
  - 80, 80, 20, 90, 50
  - 100, 30, 70, 60, 100
  - 29, 39, 69, 24
26. All the following have a median of 20 except \_\_\_\_\_.
- 40, 40, 20, 50, 10
  - 5, 6, 20, 3, 30, 40, 50
  - 10, 10, 30, 40
  - 50, 60, 50, 20, 10, 15, 20
27. What is the range of 70, 10, 30, 40, 50, 60?
- 50
  - 40
  - no range
  - 60
28. What is the median weight loss for Karen in the past 5 weeks?  
2 lbs., 1 lb., 3 lbs., 3.5 lbs., 1.5 lbs.
- 1 lb.
  - 2.5 lbs.
  - 2 lbs.
  - 1.8 lbs.

## OPEN-ENDED QUESTIONS

Use the chart to answer these questions.

1. Suppose Jackie enrolls in the class and her height is 125 cm. How does this affect the mean?

HEIGHTS OF STUDENTS IN CLASS

Name	Height (cm)
Kathy	129
Jean	154
Tim	147
George	183
Charles	171
Megan	154
Dolly	161
Sam	154
Karen	164
Allen	172
James	154

For this response, make sure you:

- \_\_\_ show all your work in solving the problem.
- \_\_\_ clearly label your answer.
- \_\_\_ tell in words **how** you solved the problem.
- \_\_\_ tell in words **why** you did the steps you did to solve the problem.
- \_\_\_ write as clearly as you can.

2. Suppose Tommy joins the class. His height is 156 cm. How does Tommy affect the mode?

For this response, make sure you:

- \_\_\_ show all your work in solving the problem.
- \_\_\_ clearly label your answer.
- \_\_\_ tell in words **how** you solved the problem.
- \_\_\_ tell in words **why** you did the steps you did to solve the problem.
- \_\_\_ write as clearly as you can.