

For Exercises 7 through 13, find the range, variance, and standard deviation. Assume the data represent samples, and use the shortcut formula for the unbiased estimator to compute the variance and standard deviation.



7. Twelve students were given an arithmetic test, and the times (in minutes) to complete it were

10, 9, 12, 11, 8, 15, 9, 7, 8, 6, 12, 10



8. The increases (in cents) in cigarette taxes for 17 states in a 6-month period are

60, 20, 40, 40, 45, 12, 34, 51, 30, 70, 42, 31,
69, 32, 8, 18, 50

Source: Federation of Tax Administrators.

9. The normal daily high temperatures (in degrees Fahrenheit) in January for 10 selected cities are as follows.

3-32

Source: *N.Y. Times Almanac*.



11. Shown here are the numbers of stories in the 11 tallest buildings in St. Paul, Minnesota.

32, 36, 46, 20, 32, 18, 16, 34, 26, 27, 26

Source: *The World Almanac and Book of Facts*.



12. The following data are the prices of 1 gallon of premium gasoline in U.S. dollars in seven foreign countries.

3.80, 3.80, 3.20, 3.57, 3.62, 3.74, 3.69

Source: *Pittsburgh Post Gazette*.



13. The number of weeks on *The New York Times Best Seller* list for hardcover fiction is

1, 4, 2, 2, 3, 18, 5, 5, 10, 4, 3, 6, 2, 2, 22

Source: *The New York Times Book Review*.

For Exercises 18 through 27, find the variance and standard deviation.

18. For 108 randomly selected college students, this exam score frequency distribution was obtained.

Class limits	Frequency
90–98	6
99–107	22
108–116	43
117–125	28
126–134	9

19. The costs per load (in cents) of 35 laundry detergents tested by a consumer organization are shown here.

Class limits	Frequency
13–19	2
20–26	7
27–33	12
34–40	5
41–47	6
48–54	1
55–61	0
62–68	2

5.6–6.2

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23. Eighty randomly selected lightbulbs were tested to determine their lifetimes (in hours). This frequency distribution was obtained.

Class boundaries	Frequency
52.5–63.5	6
63.5–74.5	12
74.5–85.5	25
85.5–96.5	18
96.5–107.5	14
107.5–118.5	5

24. These data represent the net worth (in millions of dollars) of 50 businesses in a large city.

Class limits	Frequency
10–20	5
21–31	10
32–42	3
43–53	7
54–64	18
65–75	7

25. These data represent the scores (in words per minute) of 25 typists on a speed test.

<u>Class boundaries</u>	<u>Frequency</u>
25.5–28.5	5
28.5–31.5	9
31.5–34.5	32
34.5–37.5	20
37.5–40.5	12
40.5–43.5	2

28. The average score of the students in one calculus class is 110, with a standard deviation of 5; the average score of students in a statistics class is 106, with a standard deviation of 4. Which class is more variable in terms of scores?

29. The average price of the Panther convertible is \$40,000, with a standard deviation of \$4000. The average price of the Suburban station wagon is \$20,000, with a standard deviation of \$2000. Compare the variability of the two prices.

30. The average score on an English final examination was 85, with a standard deviation of 5; the average score on a history final exam was 110, with a standard deviation of 8. Which class was more variable?

31. The average age of the accountants at Three Rivers Corp. is 26 years, with a standard deviation of 6 years; the average salary of the accountants is \$31,000, with a standard deviation of \$4000. Compare the variations of age and income.