

Choosing Measures of Central Tendency

Practise

For help with #1 to #3, refer to Example 1 or Example 2 on pages 309–310.

1. a) What are the mean, median, and mode for the following data set? Round your answers to the nearest tenth, if necessary.
16 53 14 16 11 11 12 13 11
- b) Which measure(s) of central tendency best describe the data? Explain.
2. You want to find out your classmates' favourite movie. Which measure(s) of central tendency would best describe the data? Explain why.
3. A student records the following hours of volunteer work for each of the past ten months: 23, 18, 21, 19, 23, 24, 84, 22, 20, 16. Which measure of central tendency best represents the data? Explain why.

Apply

4. The tally chart represents the sizes of running shoes that were sold last Saturday.

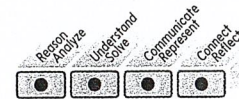
Size	7	8	9	10
Number Sold				



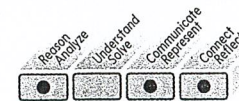
- a) What are the mean and the mode sizes of shoe?
- b) If you are restocking the shoes at the end of the day, which measure of central tendency is more meaningful? Why?

5. **Competency Check** A realtor in Rainbow Town sold the following houses in the past month.

House Description	Selling Price (\$)
Red starter house	380 000
Blue House	440 000
Green House	445 000
Grey house	550 000
Pink mansion	2 100 000



- a) What are the median and mean prices?
- b) Which measure of central tendency is more representative of the house prices in Rainbow Town? How do you know?
6. Identify the measure of central tendency that best describes each of the following. Explain why you chose that measure.
 - a) the number of pages in a typical textbook
 - b) the most requested song at a school dance
 - c) the middle-ranked person on a basketball team, in terms of height
 - d) the typical distance run around the track by a student in a Phys. Ed. class
 - e) the most frequent number of successful serves by the members of a volleyball team during a serving practice



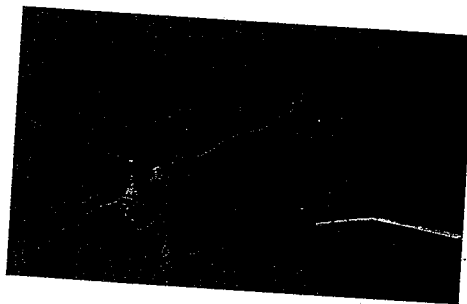
7. Pina plays defence for her school's hockey team. Her time on the ice for each game is recorded as follows, in minutes: 21, 22, 19, 24, 23, 19, 20, 24.
- Find the median and mean.
 - Find the mode(s). What do you notice?
 - Which measure of central tendency best describes a typical game for Pina? Explain.

8. **Competency Check** A clothing store is ordering winter jackets. The table shows the sizes that sold last month.

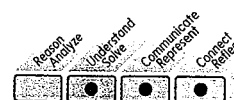
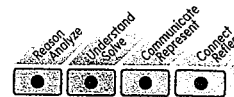
Size	Frequency
30	1
32	1
34	3
36	7
38	4
40	2
42	1
44	1

- Find the three measures of central tendency. Explain how you found them.
 - Which of these measures is the most important to the store manager? Explain why.
9. Seven judges gave the following scores for Susan's diving performance: 7.2, 6.8, 7.3, 8.0, 8.5, 8.2, 6.8.

- What is the mean? Round your answer to the nearest tenth.
- What is the median?
- What is the mode?
- Which measure(s) of central tendency best represent the centre of the data? Explain why.



10. In many diving competitions, the high score and the low score are thrown out and the diver's actual score is determined from the five remaining scores.
- Why do think the practice of removing the high and the low score is used?
 - In #9, remove the high and the low scores and recalculate the mean, median, and mode. Which measures of central tendency are affected the most?




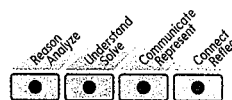
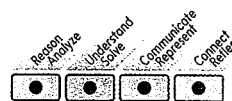
11. A school is collecting canned food for a holiday food drive. The chart shows the number of cans collected by grade.

Grade	Number of Students	Total Cans Collected
1	20	100
2	24	96
3	22	99
4	20	120
5	18	90
6	26	130
7	25	125

Analyze the data as you see fit and determine which class should win a prize. Show any calculations that you made and justify your choice.

Extend

12.  **Competency Check** A set of five distinct natural numbers has a mean of 6 and a median of 6. What is the largest possible number in the set? Explain your thinking.
13. Min records the number of free throws she made out of ten attempts during each basketball practice:
4, 4, 5, 7, 4, 8, 9, 8, 7, 8.
- What are the median, mode, and mean?
 - In your opinion, does one measure of central tendency best describe the data?
 - How many successful free throws do you think Min will make at tomorrow's practice? Explain your thinking.
 - Explain why these measures of central tendency might not be meaningful in this case.



9.2 Choosing Measures of Central Tendency, pages 308–313

1. **a)** mean = $17\frac{1}{2}$; median = 13; mode = 11
b) Answers will vary. For example: because one value is significantly higher than the others, median may be preferred.
2. Mode may be preferred to reflect a group's favorite movie.
3. Answers will vary. For example: because one value is significantly higher than the others, median may be preferred.
4. a) mean = $7.91\bar{6}$; modes = 7 and 8
b) mode: the number of each size that have sold is important for knowing which sizes need to be restocked.
6. Explanations will vary.
a) mean **b)** mode **c)** median **d)** mean **e)** mode
7. a) median = 21.5 min, mean = 21.5 min
b) modes = 19 and 24; Answers will vary. For example: the mean of the two modes is the same as the mean and median for the entire data set.
c) Mean may be preferred because all of the times are very close to each other. She averages 21.5 min per game.
9. a) approximately 7.5 **b)** 7.3 **c)** 6.8
10. a) Answers will vary. For example: this practice can help reduce bias, so one judge cannot influence the outcomes by giving an unfairly high or low score.
b) The mean is slightly altered, the median is not altered, and the mode is eliminated.
11. Answers will vary. For example: the grade 4s averaged 6 cans per student, which is more than any other grade, so they should win the prize.
13. a) median = 7, modes = 4 and 8, mean = 6.4
b) Answers will vary. For example: the mean may be preferred because it is the average.
c) Answers will vary. For example: Min should likely make between 7 and 9 free throws, based on her most recent performance.
d) Answers will vary. For example: none of the measures of central tendency account for improvement over time.
14. Answers will vary. One example is 1, 1, 28, 82.
15. a) 39.25
b) 43; 80% of 250 total marks available is 200. He already has 157, so he needs 43 more.
16. 2, 7, 7, 8