

Teachers and students of 7th Grade Mathematics:

Please find attached the Study Guide for the Marion County Grade 7 Mathematics Common End Of Course (CEOC) Exam.

When creating the study guide, I used the Competency Matrix (CM) for the CEOC and chose a question or two from each benchmark that should have been covered throughout the year. I pulled questions from the [Item Specifications](#) on the FLDOE website, as well as our county FCAs and example problems from the Big Ideas and Glencoe MathConnects textbooks.

For additional practice, I would recommend the “Correlation” page offered by Big Ideas Math. You can search for example problems in the book by standard. This page can be found by following this link: http://www.bigideasmath.com/protected/content/ac/fl/gr_7_assessment_benchmark_correlation.pdf

Study Guides for all middle and high school mathematics exams can be found on the Marion County Public Schools website [here](#).

Please contact me with any suggestions, questions, comments, etc.

Chris Hanes, Math Program Specialist

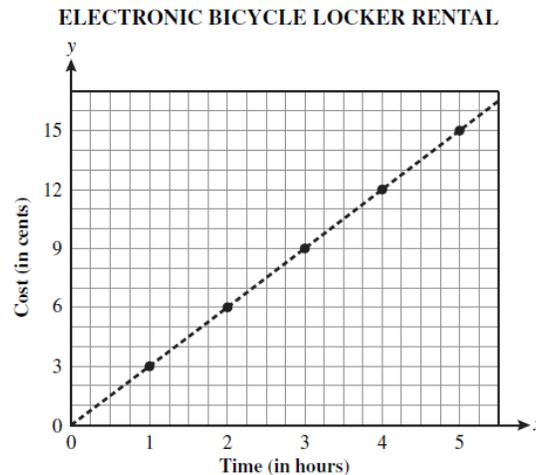
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Grade 7 Advanced Mathematics Common End-Of-Course Exam Study Guide

7.A.1.4 **Graph proportional relationships and identify the unit rate as the slope of the related linear function**

1. Electronic bicycle lockers are public storage lockers designed specifically for the storage of bicycles in a transit station. These lockers can be rented for an annual fee. The graph below shows the cost of renting an electronic bicycle locker with the annual fee changed to an hourly rate.



Which of the following shows the rate for renting an electronic bicycle locker?

- A. 1 cent per 3 hours
- B. 3 cents per 1 hour
- C. 5 cents per 16 hours
- D. 16 cents per 5 hours

2. Find the unit rate: \$3.20 for 8 ounces

7.A.1.5 **Distinguish direct variation from other relationships, including inverse variation.**

3.

Which of the following tables does NOT represent a direct variation between x and y ?

A.

x	3	6	12	24
y	4	8	16	32

B.

x	5	8	11	14
y	6	9	12	15

C.

x	2	6	8	10
y	5	15	20	25

D.

x	1	3	9	27
y	3	9	27	81

Tell whether x and y show direct variation, inverse variation, or neither.

4. $xy - 11 = 5$

5. $8 = \frac{y}{x}$

7.A.1.6 **Apply proportionality to measurement in multiple contexts, including scale drawings and constant speed.**

6. Dale and his family are planning a trip from Seattle to Miami. The distance between the cities is 5322 kilometers. Dale drew a line segment on a U.S. map from Seattle to Miami to show his younger sister the distance between the two cities. If the scale on the map shows that 2 centimeters represents 600 kilometers, what is the length of the line segment Dale drew on the map between the two cities?

- A. 4.44 cm
- B. 8.87 cm
- C. 10.87 cm
- D. 17.74 cm

7. Dominic drove 324 miles from Salt Lake City, Utah, to Bryce Canyon National Park in 6 hours and 45 minutes. What was his average speed, in miles per hour?

7.A.5.1 Express rational numbers as terminating or repeating decimals.

8. Express $\frac{13}{36}$ as a repeating decimal.

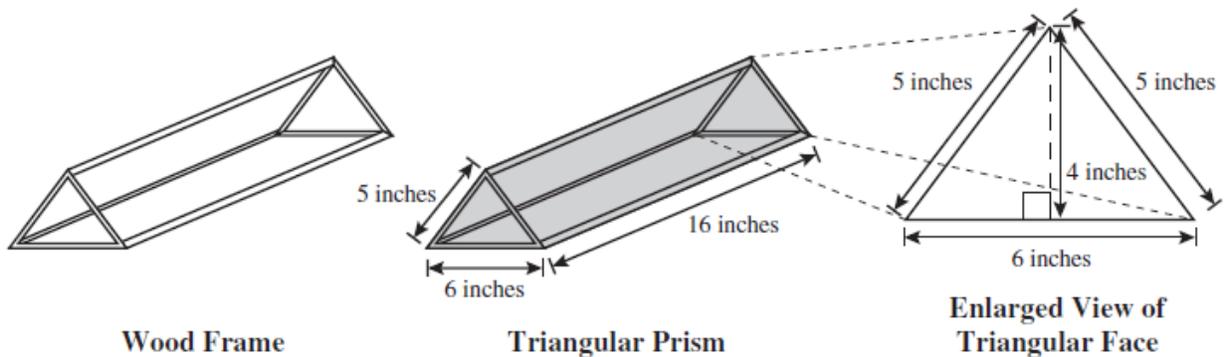
9. Write as a decimal: $\frac{36}{5}$

7.G.2.1 Justify and apply formulas for surface area and volume of pyramids, prisms, cylinders, and cones.

10. Jonah is calculating the volume of a right circular cylinder. Which of the following is a correct method for calculating the volume of a cylinder?

- A. Calculate the area of the base and multiply by the height.
- B. Calculate the circumference of the base and multiply by the height.
- C. Calculate the area of the base, multiply by 2, and multiply by the height.
- D. Calculate the circumference of the base, multiply by 2, and multiply by the height.

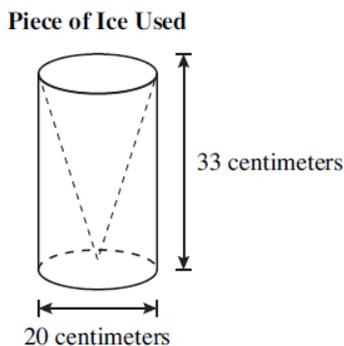
11. Maura made a wood frame and covered it with transparent red plastic wrap to create a triangular prism, as shown below.



What is the total surface area, in square inches, of the prism?

7.G.2.2 **Use formulas to find surface areas and volume of three-dimensional composite shapes.**

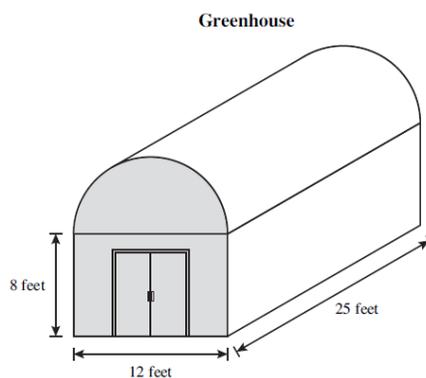
12. Rebecca used a right circular cylinder piece of ice to cut out a cone. The dimensions of the ice piece she used are shown below.



Which is closest to the volume of the remaining ice after Rebecca removes the largest cone possible from the right circular cylinder?

- A. 1351 cm^3
- B. 3456 cm^3
- C. 6911 cm^3
- D. $10,367 \text{ cm}^3$

13. The greenhouse shown below has the shape of half a cylinder and a rectangular prism.



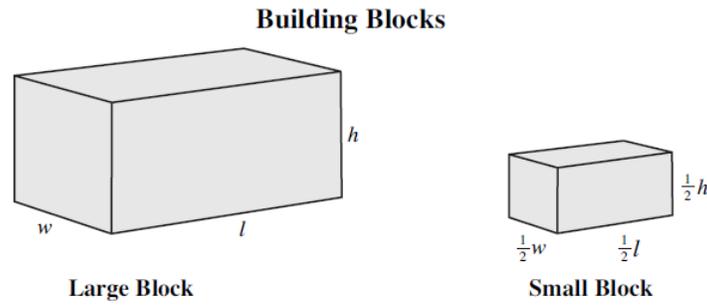
In order to air-condition the building, the owner needs to know the volume of air space in the empty greenhouse. What is the volume, **in cubic feet**?

7.G.4.1 **Determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures and apply these relationships to solve problems.**

14. Toni has a rectangular vegetable garden that measures 12 feet by 18 feet. She wants to reduce the area of her garden. If Toni reduces the dimensions of her garden to 12 feet by 9 feet, how will the area of the new garden compare to the area of the old garden?

- A. The area will be one-half as large.
- B. The area will be two-thirds as large.
- C. The area will be one-fourth as large.
- D. The area will be three-fourths as large.

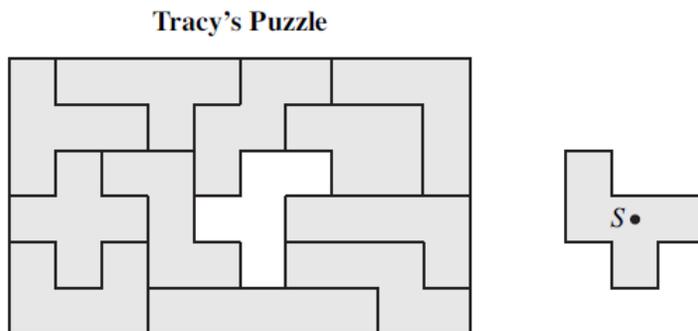
15. Jeff is building walls using the building blocks shown below. The dimensions of the small blocks are $\frac{1}{2}$ the size of the dimensions of the large blocks. Jeff's wall has a length (l) of 5 large blocks and a height (h) of 2 large blocks.



How many small blocks does Jeff need to build a wall with the **same volume** as the wall he made with large blocks?

7.G.4.2 Predict the results of transformations and draw transformed figures, with and without the coordinate plane.

16. Tracy is playing a puzzle game on the computer. She has placed all the pieces in the puzzle except for one, as shown below.

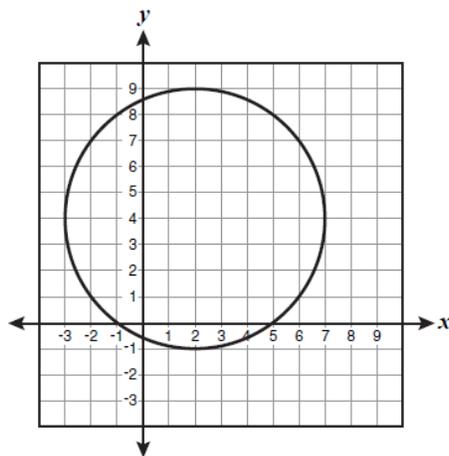


Tracy can complete the puzzle by performing two transformations on the remaining puzzle piece. Which two transformations should Tracy perform?

- A. a 90° clockwise rotation about point S , followed by a translation to the left
- B. a 90° counterclockwise rotation about point S , followed by a translation to the left
- C. a reflection across a vertical line, followed by a 90° clockwise rotation about point S
- D. a reflection across a vertical line, followed by a 90° counterclockwise rotation about point S

7.G.4.3 Identify and plot ordered pairs in all four quadrants of the coordinate plane.

17. Daniel drew a circle on a grid, as shown below



Which coordinates best represent the location of a point that is NOT on the circle?

- A. $(-3, 4)$
- B. $(-1, 8)$
- C. $(7, 4)$
- D. $(8, 5)$

7.P.7.1 **Determine the outcome of an experiment and predict which events are likely or unlikely, and if the experiment is fair or unfair.**

18. Mrs. Davis is teaching her class about probability. She prepared the set of golf balls listed below.

- 6 red golf balls, each labeled with a different number from 1 to 6
- 7 green golf balls, each labeled with a different number from 1 to 7
- 8 blue golf balls, each labeled with a different number from 1 to 8
- 9 yellow golf balls, each labeled with a different number from 1 to 9

Mrs. Davis put all the golf balls into a sack and mixed them up. Nancy will be the first student to select a golf ball from the sack without looking. Which of the following outcomes is **most likely** to occur?

- A. Nancy will select a yellow golf ball.
- B. Nancy will select a golf ball that is not blue.
- C. Nancy will select a golf ball with the number 6 on it.
- D. Nancy will select a golf ball with a number on it that is not 1.

7.P.7.2 **Determine, compare, and make predictions based on experimental or theoretical probability of independent or dependent events.**

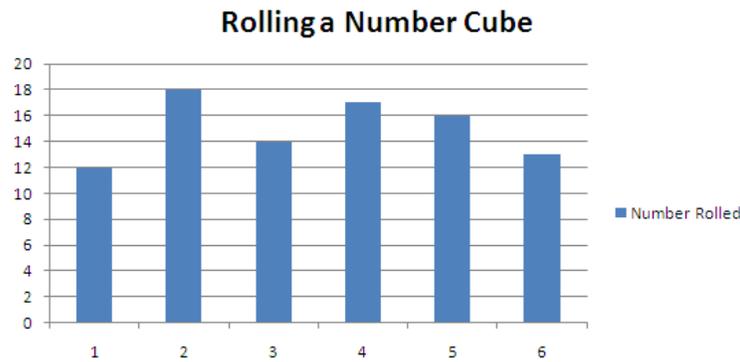
19. James has the set of cards shown below.



James will shuffle the cards, select one without looking, record the number of the card, and return the card to the set. He will repeat this process 50 times. Which is closest to the number of times he should expect to select a card with a number greater than 5?

- A. 6
- B. 10
- C. 19
- D. 25

Use the bar graph below to find the experimental probability of the event.



20. Rolling a 1 or 2.

21. *Not* rolling a 5.

7.S.6.1 Evaluate the reasonableness of a sample to determine the appropriateness of generalizations made about the population.

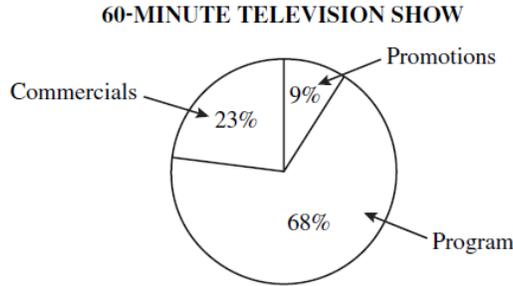
22. A cable television company will add new channels to its service. The company president wants to have 100 customers surveyed by telephone in a single weekend to find out what kind of channels customers want. Which method would increase the bias in the survey?

- A. performing the survey over a period of one week
- B. increasing the number of customers surveyed to 300
- C. surveying the 100 customers who have had cable service with this company for the longest period of time
- D. mailing the survey questions to all the customers and offering a 25% discount on cable service to the first 100 customers who return the survey

23. Of 40 randomly chosen students surveyed, 15 chose the amusement park as their favorite field trip. There are 480 students in the school. Predict the number of students in the school who would choose the amusement park as their favorite field trip.

7.S.6.2 **Construct and analyze histograms, stem-and-leaf plots, and circle graphs.**

24. Television programs are separated into parts by commercials and network promotions. The circle graph below shows the percent of a 60-minute television show that is used for commercials, promotions, and the program itself.



Which is closest to the number of minutes used for commercials and promotions during that 60-minute television show?

- A. 5
- B. 14
- C. 19
- D. 32

8.A.1.1 **Create and interpret tables, graphs, and models to represent, analyze, and solve problems related to linear equations, including analysis of domain, range and the difference between discrete and continuous data.**

25. A catering service charges a \$50 setup fee, plus a set amount per guest, to provide food and beverages for a dinner party. Below is a table that lists the total cost of a dinner party for a certain number of guests.

**TOTAL COST OF CATERING
A DINNER PARTY**

Number of Guests	Total Cost (in dollars)
10	150
20	250
30	350
40	450
50	550

What is the total cost, in dollars, if 75 guests attend a dinner party?

26. Sandy conducted an experiment with sound waves in dry air at 20C. She observed that a linear relationship exists between the time and distance that sound travels under these conditions. She recorded her findings in the table below.

**DISTANCE SOUND TRAVELS
IN DRY AIR AT 20°C**

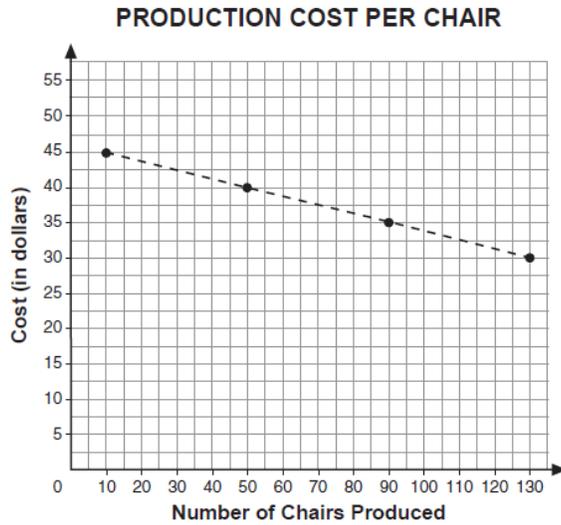
Time (in seconds)	Distance (in kilometers)
4.0	1.372
5.0	1.715
6.0	2.058
7.0	2.401
8.0	2.744

Based on the information in the table, which of the following is a valid statement about Sandy's recorded findings?

- A. Sandy's data is discrete with a range of $4 \leq x \leq 8$.
- B. Sandy's data is continuous with a range of $4 \leq x \leq 8$.
- C. Sandy's data is discrete with a range of $1.372 \leq x \leq 2.744$.
- D. Sandy's data is continuous with a range of $1.372 \leq x \leq 2.744$.

8.A.1.2 Interpret the slope and intercepts (X and Y) when graphing a linear equation for a real-world problem.

27. The production manager of a furniture manufacturing company plotted values on the graph below to show how the production cost per chair decreases as the number of chairs produced increases. The slope of the dashed line segment joining these points is $-\frac{1}{8}$.

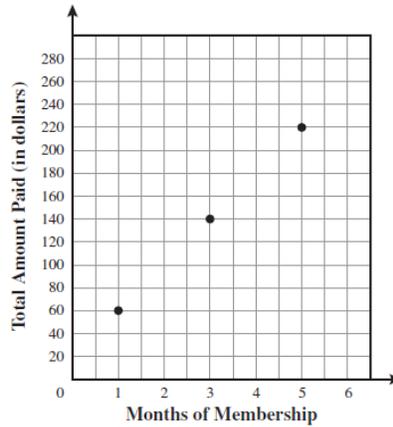


Which statement does this slope of the dashed line segment represent?

- A. Each chair produced decreases the cost per chair by \$5.
- B. Each chair produced decreases the cost per chair by \$8.
- C. For every 8 chairs produced, the cost per chair decreases by \$1.
- D. For every 10 chairs produced, the cost per chair decreases by \$5.

28. Membership to unlimited monthly car washes at a local car wash costs \$20 plus a monthly fee, as shown on the graph below.

UNLIMITED MONTHLY CAR WASHES



What is the y-intercept of the linear relationship shown?

8.A.1.6 **Compare the graphs of linear and non-linear functions for real-world situations.**

29. The table below shows the surface area S (in square inches) of a cube with a side length of x feet. Does the table represent a linear or nonlinear function?

Side Length, x	1	2	3	4
Surface Area, S	6	24	54	96

8.A.4.2 Solve and graph one- and two-step inequalities in one variable.

30. By United States law, any food labeled “reduced fat” must have at least 25% less fat per serving than the regular version of that food. The inequality below can be used to calculate the allowable fat content of a food labeled “reduced fat.”

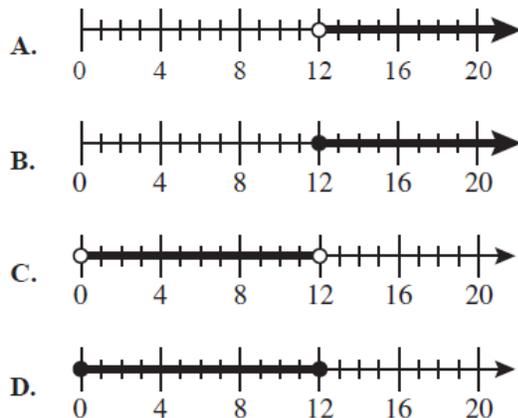
$$x \leq \frac{3}{4} y$$

where:

x = the number of fat grams per serving in the “reduced fat” food

y = the number of fat grams per serving in the regular-version food

One serving of regular crunchy peanut butter has 16 grams of fat. Which number line represents all possible numbers of fat grams that may be in one serving of “reduced fat” crunchy peanut butter while meeting the requirements of U.S. law?



31. Austin saved \$455 from his pay and joined a golf club to improve his game. He paid a \$100 membership fee and will pay \$15 for each round of golf he plays.

Austin used the following inequality to determine the number of rounds of golf he could play.

$$100 + 15r \leq 455$$

What is the maximum number of rounds of golf Austin can play?

8.A.6.1 **Use exponents and scientific notation to write large and small numbers (and vice-versa) and to solve problems.**

32. By studying lunar samples, scientists have learned the Moon is approximately 4,600,000,000 years old. What is this number expressed in scientific notation?

- A. 4.6×10^8
- B. 46×10^8
- C. 4.6×10^9
- D. 46×10^9

33. A **nanosecond** is one billionth of a second. What is the **exponent** associated with the base 10 when 0.000000001 is expressed in scientific notation?

8.A.6.2 **Make reasonable approximations of square roots and mathematical expressions that include square roots and use them to estimate solutions to problems and to compare mathematical expressions involving real numbers and radical expressions.**

34. Andre will install carpet in his bedroom. The floor in Andre's bedroom is square, with an area of 65 square feet. Which is closest to the length, in feet, of each side of Andre's bedroom floor?

- A. 8
- B. 9
- C. 16
- D. 17

35. Simplify the expression: $3\sqrt{15} - 7\sqrt{15}$

8.A.6.4 **Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, and irrational numbers) using multi-step and real-world problems.**

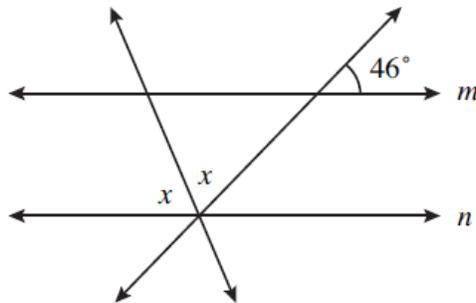
36. The human body produces 1.5×10^7 red blood cells every second. How many red blood cells, expressed in scientific notation, does the human body produce in a 60-second period?

- A. 9.0×10^7
- B. 9.0×10^8
- C. 90.0×10^7
- D. 90.0×10^8

37. The daily lunch special at Bertan's favorite restaurant costs \$6.95, not including tax. The final cost of the lunch special with tax is \$7.52. What is the tax rate, **to the nearest tenth of a percent**, charged for the lunch special?

8.G.2.2 **Classify and determine the measure of angles, including angles created when parallel lines are cut by transversals.**

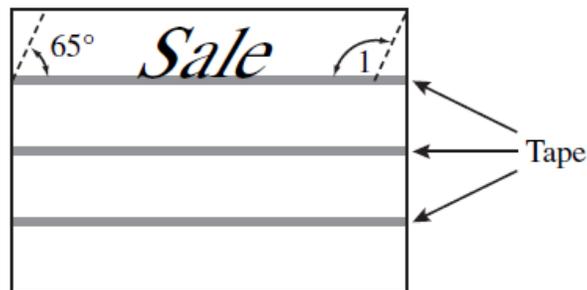
38. In the figure below, lines m and n are parallel. Two transversals intersect on n , forming several angles, as shown on the diagram below.



What is the measure of $\angle x$?

- A. 44°
- B. 46°
- C. 60°
- D. 67°

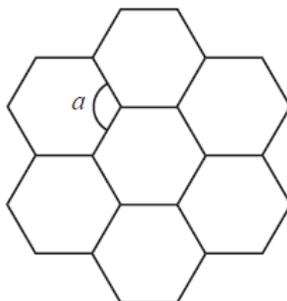
39. Anthony used strips of tape to guide him in painting an advertisement on a rectangular-shaped store window. The strips of tape are parallel and taped on the glass window. When he writes the message, he wants the letters to be slanted at 65° angles. The first word is shown below.



What is the measure, **in degrees**, of $\angle 1$?

8.G.2.3 **Demonstrate that the sum of the angles in a triangle is 180 degrees and apply this fact to find unknown measures of angles, including the sum of angles in a polygon.**

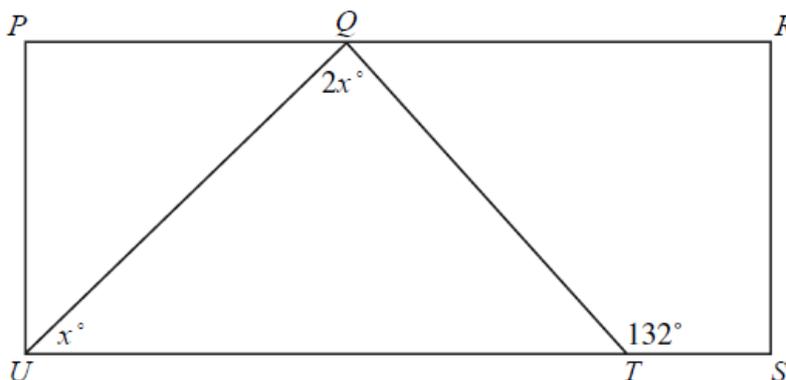
40. Lou is studying the design of a honeycomb. The honeycomb design is made up of regular hexagons, as shown below.



What is the measure, **in degrees**, of $\angle a$ above?

- A. 60
- B. 120
- C. 150
- D. 240

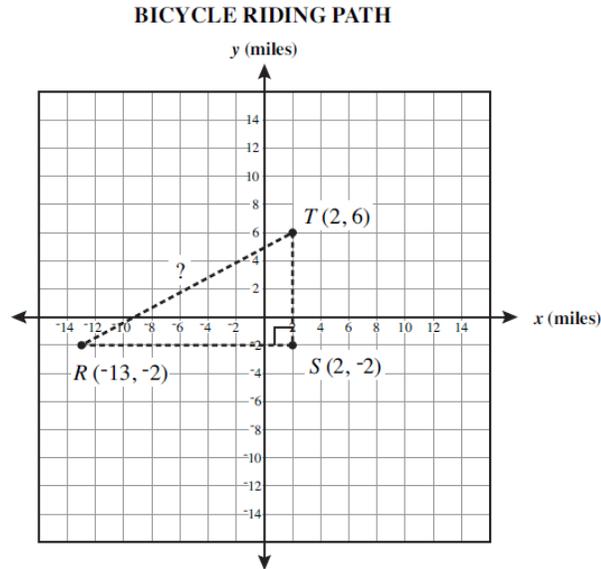
41. Vertices Q and T of $\triangle QTU$ are located on opposite sides of rectangle $PRSU$, as shown in the diagram below.



What is the value of x ?

8.G.2.4 **Validate and apply Pythagorean Theorem to find distances in real world situations or between points in the coordinate plane.**

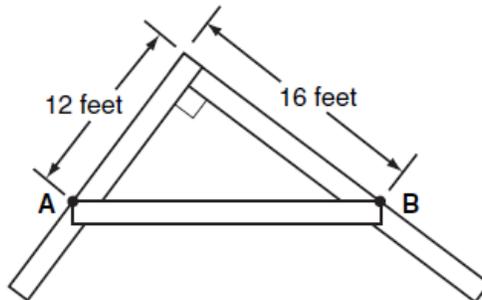
42. On the coordinate plane below, $\triangle RST$ shows the path bicycle riders will follow on one of their weekly rides.



What is the total distance from point R to S to T and back to point R ?

- A. 17 miles
- B. 23 miles
- C. 32 miles
- D. 40 miles

43. A *truss* is a triangular structure that helps to support the roof of a building.



The truss above has one side measuring 12 feet and another side measuring 16 feet. How long, **in feet**, is the third side of the truss, from Point A to Point B ?

8.G.5.1 **Compare, contrast, and convert units of measure between different measurement systems (US Customary or Metric – SI), dimensions, and derived units to solve problems. (Assessed with 7.G.4.4.)**

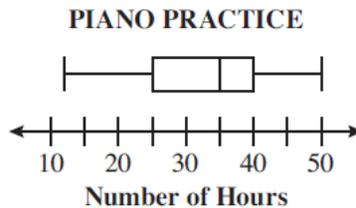
44. According to one source, one of the seven ancient wonders of the world, the Colossus of Rhodes, was a statue approximately 110 feet high located on the island of Rhodes, Greece. Which of the following is closest to 110 feet expressed in meters?

- A. 361
- B. 280
- C. 43
- D. 34

45. A farmer needs to calculate the number of cubic yards in 837 cubic feet of soil. How many **cubic yards** are equivalent to 837 cubic feet?

8.S.3.1 **Select, organize, and construct appropriate data displays, including box-and-whisker plots, scatter plots, and lines of best fit to convey information and make conjectures about possible relationships.**

46. Ms. Davis drew a box-and-whisker plot to display data about the number of hours her piano students practiced last month, as shown below.



What whole number best represents the median number of hours her students practiced playing the piano last month?

8.S.3.2 **Determine and describe how changes in data values impact measures of central tendency.**

47. Annie runs 5 days per week to train for a race. Her running distance for each of four days this week is shown in the table below.

RUNNING DISTANCE

Day	Distance Run (in kilometers)
Tuesday	3.3
Wednesday	6.8
Friday	7.2
Saturday	8.0
Sunday	

What is the number of kilometers Annie must run on Sunday to have a **mean** running distance of exactly 6.1 kilometers per day for the 5 days?

- A. 4.7
- B. 5.2
- C. 6.3
- D. 7.0