MCAS Review

Topic #6:
Full Practice
Test 2

Practice Test 2
Mathematics
SESSION 1

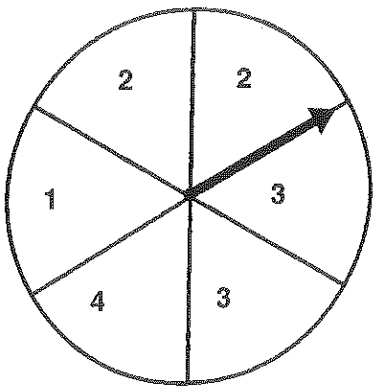
You may use your reference sheet during this session.
You may not use a calculator during this session.

DIRECTIONS
This session contains fourteen multiple-choice questions, four short-answer questions, and three open-response questions. Mark your answers to these questions in the spaces provided on your answer sheet.

11 Frankie has 30 baseball cards at the beginning of the week. If x represents the number of baseball cards Frankie gave to his friend Amy on Tuesday, and y represents the number of baseball cards his mother gave him on Thursday, which expression shows the number of baseball cards Frankie has at the end of the week?

A. $x + 30 - y$
B. $30 - x + y$
C. $30x - y$
D. $30y + x$

12 Find the probability of spinning a "2" on the spinner below.



A. $\frac{1}{6}$
B. $\frac{1}{4}$
C. $\frac{1}{3}$
D. $\frac{1}{2}$

3. Which number below is the greatest?

A. $\sqrt{196}$

B. $3\sqrt{12}$

C. 2^4

D. 3^3

4. Jeffrey needs to simplify the following expression on his homework assignment.

$$4(x + 2y) + 2(3x - y) - (x + y)$$

Which of the following expressions is equivalent to the expression above?

A. $10x - 7y$

B. $9x + 5y$

C. $-12x$

D. $-12x + 7y$

5. Given the inequality $6x < 42$, solve for x.

A. $x = 7$

B. $x < 7$

C. $x > 7$

D. $x \leq 7$

6. Lisa has a bag of 30 marbles. Five of these marbles are white, 3 are blue, 10 are pink, 5 are red, 2 are green, 3 are orange, and 2 are black. If Lisa reaches into the bag and pulls out a marble without looking, what is the probability that she will pull out a red marble?

A. $\frac{1}{30}$

B. $\frac{1}{6}$

C. $\frac{1}{5}$

D. $\frac{1}{4}$

7. Simplify the expression below.

$$\frac{3y}{y^3}$$

A. $3y^2$

B. $\frac{3y}{y}$

C. $\frac{3}{y^2}$

D. $\frac{3}{y^3}$

8 Teresa plans to set up a lemonade stand at a local fair. She will purchase 250 cans of lemonade for $75 and will charge $2.50 for each can she sells. In addition to the cost of the lemonade, Teresa will need to pay $20 to set up the stand. Which of the following expressions could Teresa use to find out how much money she could make after expenses, for selling x cans of juice?

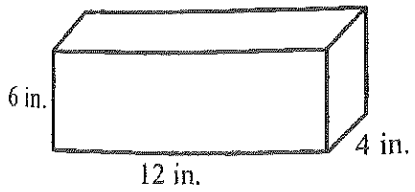
A. $2.5x - 75 - 20$

B. $x + 2.50 - 75 - 20$

C. $2.50 - 75 - \frac{20}{x}$

D. $2.5x\,(75 - 20)$

9 Rounding to the nearest inch, what is the volume of the box pictured below?



A. 22 in^3

B. 72 in^3

C. 288 in^3

D. 576 in^3

10 Dawn recorded the number of cats adopted at her local animal shelter from January through July.

January	210
February	180
March	212
April	215
May	175
June	195
July	220

What is the **mean** number of cats adopted at the animal shelter?

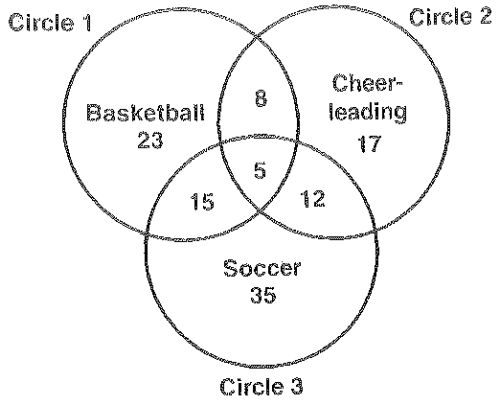
A. 194

B. 201

C. 208

D. 215

11 Ms. Roberts constructed a diagram to illustrate the number of girls who are enrolled in the athletic program.



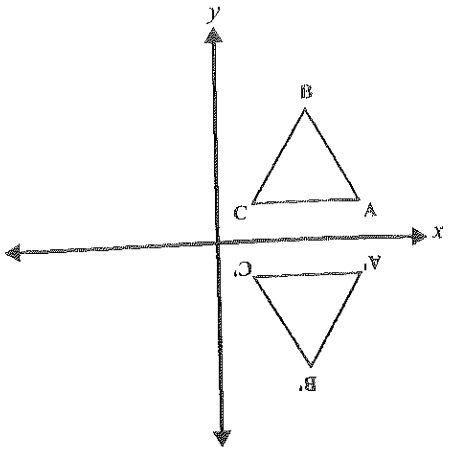
How many girls play both basketball and soccer, but are not cheerleaders?

A. 8
B. 12
C. 15
D. 35

12 Which of the following is closest to the value of $(\sqrt{81})^3$?

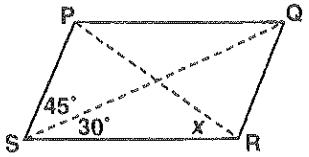
A. 13.5
B. 27
C. 243
D. 729

13 In the diagram below, triangle ABC is reflected over the y-axis and rotated how many degrees about the origin counterclockwise?



A. 45°
B. 90°
C. 180°
D. 360°

14 The figure shown below is a parallelogram.

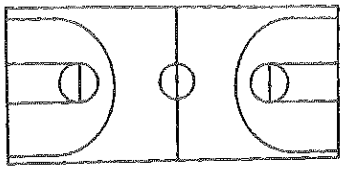


What is the measure of angle R?

A. 165°
B. 105°
C. 95°
D. 75°

Questions 15 and 16 are short-answer questions. Write your answer to these questions in the boxes provided on your answer sheet. Do not write your answers in this test section. You may do your figuring on the answer sheet.

15 A high school basketball court that meets the regulation size requirement measures 100 feet long and 50 feet wide.



Leo's elementary school uses a basketball court that is similar in size and shape but has a length 20 feet shorter than the high school regulation basketball court. What is the width, in **feet**, of the elementary school basketball court?

16 Rubina purchased 2 pairs of sneakers for $84.99. The sneakers were discounted 20% the next week, and the store manager agreed to give Rubina a refund equal to the amount of the discount. How much would the sneakers have cost if Rubina had waited one week? Show your work in the space below.

Mark your answer to multiple-choice question 17 on your answer sheet.

17 Jose's scores in psychology class are 94, 69, 84, 78, 90, 75, 94, 90, 90, and 95. What is the **mode** of his test scores?

A. 26

B. 86

C. 90

D. 92

Questions 18 and 19 are short-response questions. Write your answer to these questions in the boxes provided on your answer sheet. You may do your figuring on the answer sheet.

18 Peter bought a mountain bike for $200. When he took the bike home, he noticed a large scratch on one side. The bike shop gave Peter a 35% refund on the bike. How much did Peter pay for the bike after the refund? Show your work.

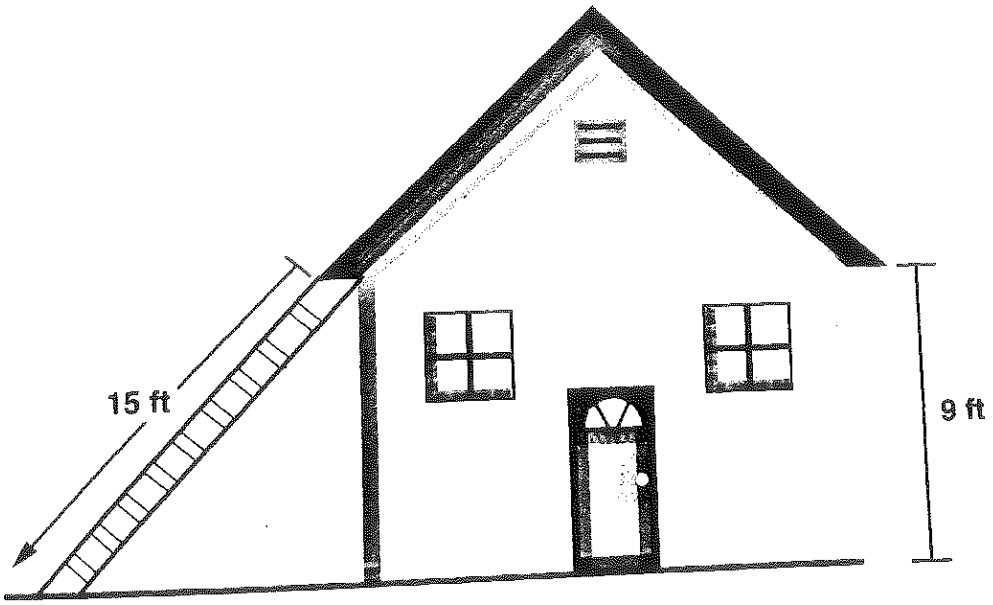
19 Ashaki joined her school's cross-country team. As part of her training, she is going to increase the distance she runs every week by 2 miles. If she runs 21 miles the first week, how many miles will she run during the eighth week?

Questions 20 and 21 are open-response questions.

- **BE SURE TO ANSWER AND LABEL ALL PARTS OF EACH QUESTION.**
- **Show all your work (diagrams, tables, or computations) on your answer sheet.**
- **If you do the work in your head, explain in writing how you did the work.**

Write your answer to these questions in the space provided on your answer sheet.

20 A contractor uses a 15-foot ladder to reach the roof. The ladder is 9 feet away from the house and forms a right triangle.



a. Find the length of the missing side of this triangle.

b. Determine the area of the triangle.

Write your answer to Question 21 in the space provided on your answer sheet.

21 The average salary for all restaurant workers in a certain area is $275 a week. The weekly salaries of 7 employees at Lobster King are given in the table below.

Employee 1	$200
Employee 2	$225
Employee 3	$240
Employee 4	$240
Employee 5	$280
Employee 6	$375
Employee 7	$400

a. Determine the measures of center of the 7 salaries.

- mean
- median
- mode
- range

b. Specify which of these measures of center the management could use to represent the salaries in an argument against pay increases. Explain your answer.

c. Specify which of these measures of center the labor union could use to represent the salaries in an argument for pay increases. Explain your answer.

Practice Test 2
Mathematics
SESSION 2

You may use your reference sheet during this session.
You may use a calculator during this session.

DIRECTIONS
This session contains seventeen multiple-choice questions and four open-response questions. Mark your answers to these questions in the spaces provided on your answer sheet.

22 In 2006, 131 million people in the United States were employed. Of these, about 13% worked in manufacturing jobs. According to this information, about how many people in the United States were employed in manufacturing jobs?

A. 13,000,000
B. 14,500,000
C. 17,030,000
D. 34,000,000

23 Melanie uses the expression $8a + 12b$ to determine the amount she earns at a pay rate of 8 dollars an hour plus time and a half for overtime. One week she worked 40 hours, plus 8 hours of overtime. What is her total pay for the week?

A. 364
B. 384
C. 410
D. 416

24 Daniel is creating a garden in his backyard. He's planting rows of shrubs like the ones shown below. The first row has 1 shrub, the second has 2, the third has 4, and the fourth has 8.

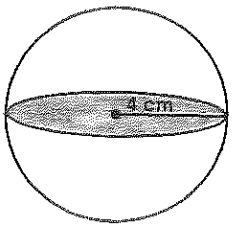
If the pattern continues, how many shrubs would be in the fifth row?

A. 8
B. 12
C. 16
D. 24

25 Beth scored 18, 18, 15, 18, 18, 24, 21, 20, 24, and 14 points during her first ten basketball games. What is her **mean** score?

A. 10
B. 18
C. 19
D. 21

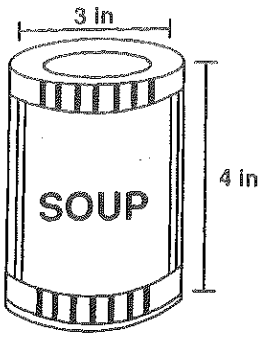
26 The sphere below is intersected halfway between the top and bottom by a plane parallel to the base of the sphere. The radius is 4 centimeters.



Which number is the **best** approximation of the area of the shaded region?

A. 6 square centimeters
B. 16 square centimeters
C. 50 square centimeters
D. 100 square centimeters

27 A can of soup has a diameter of 3 inches and height of 4 inches.



a. What would be the volume of the soup can if the diameter were increased by 1 inch? Figure to the nearest hundredth. Show your work.

b. What would be the volume of the original soup can if the height were increased by 1 inch? Figure to the nearest hundredth. Show your work.

c. The cost to produce a soup can is $0.12 per cubic inch of capacity (volume). What is the difference in cost per can to produce the soup cans in parts (a) and (b)? Figure to the nearest cent. The soup can in which part costs less? Show your work.

28 During the last five years, the population in Frieda's town decreased from 3.6 million to 1.8 million. What was the **percent of decrease** in Frieda's town over the past five years?

A. 25%
B. 35%
C. 50%
D. 60%

29 A clothing store marked all sweaters $\frac{1}{4}$ off the original price for a sale. Alex has a store coupon that is good for an additional discount of 10% off the sale price. She wants to purchase a sweater that was originally priced at $45.00. If she uses her discount coupon, what should be the cost of the sweater before the sales tax is added?

A. $14.55
B. $23.75
C. $30.38
D. $33.75

30 Cecily has a photograph that measures 8 inches wide and 10 inches in length. If Cecily has the photograph enlarged so that it is 24 inches wide, how long will the picture be?

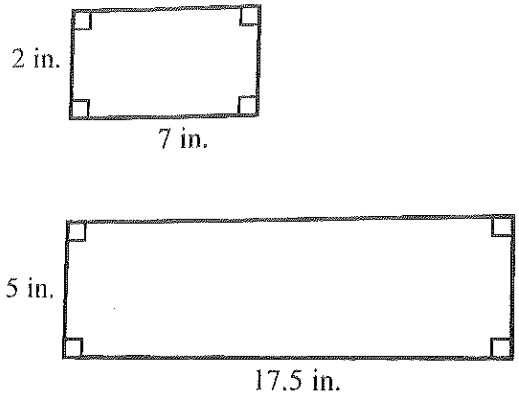
A. 24 inches
B. 30 inches
C. 240 inches
D. 320 inches

Question 31 is an open-response question.

- **BE SURE TO ANSWER AND LABEL ALL PARTS OF THE QUESTION.**
- **Show all your work (diagrams, tables, or computations) on your answer sheet.**
- **If you do the work in your head, explain in writing how you did the work.**

Write your answer to question 31 in the space provided on your answer sheet.

31 Look at the figures below.



a. Explain in geometric terms why the rectangles are similar.

b. How are the areas related as a ratio, as a reduced fraction, or decimal?

c. If another rectangle with a length of 35 inches is similar to the rectangles shown above, what would be the area of this rectangle?

Mark your answers to multiple-choice questions 32 through 40 in the spaces provided on your answer sheet.

32 Madeline earns $8.25 an hour babysitting her cousins during the 10 weeks of summer vacation. If she averages 12 hours per week, how much does Madeline earn during the summer?

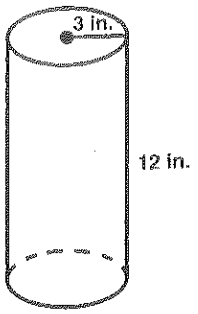
A. $82.50
B. $99.00
C. $825.00
D. $990.00

33 If a jacket originally cost $75 and is selling at a 20% discount, what is the amount of the discount?

A. $7.50
B. $11.25
C. $15.00
D. $18.75

34 Determine the volume of a cylinder with a radius of 3 inches and a height of 12 inches. Use 3.14 for π.

$$V = \pi r^2 h$$



A. 108 in^3
B. 113 in^3
C. 226 in^3
D. 339 in^3

35 $\begin{bmatrix} 1 & 3 \\ 4 & 3 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = 9 \\ = 24$

represents which system of equations?

A. $y + 3x = 9$
$4y + 3x = 24$
B. $x + 3y = 9$
$4x + 3y = 24$
C. $4x + y = 9$
$3x + 4y = 24$
D. $x + 3y = 9$
$x + 12y = 24$

36 The population of Gina's town grew from 1.5 million ten years ago to 2.7 million today. What was the percent of increase in the population of Gina's town over ten years?

A. 44
B 55
C. 64
D. 80

37 What is the area of a circle with a diameter of 12 centimeters?

A. 36 cm^2
B 113 cm^2
C. 144 cm^2
D. 452 cm^2

38 Charlie wants the mean of his 5 English test scores to be at least 85%. His scores on the first 4 tests are 80%, 83%, 90%, and 92%. What is the minimum score Charlie can earn on the 5th test to meet his goal?

A. 75
B. 80
C. 85
D. 90

39 Christa found the following information showing the percentages of students at her school taking part in after-school activities during the past 12 months:

Clubs	75%
Sports	47%
Student Government	8%
Employment	28%
Other	10%

Which type of graph is most appropriate for displaying this information?

A. a line graph

B. a circle graph

C. a scatter plot

D. a bar graph

40 What is the twelfth term in this sequence?

2, 3, 5, 8, 13, ...

A. 192

B. 233

C. 377

D. 610

Questions 41 and 42 are open-response questions.

- **BE SURE TO ANSWER AND LABEL ALL PARTS OF EACH QUESTION.**
- **Show all your work (diagrams, tables, or computations) on your answer sheet.**
- **If you do the work in your head, explain in writing how you did the work.**

Write your answer to these questions in the space provided on your answer sheet.

41 Nora's Catering Service charges a flat fee of $100 per job, plus $10 per guest attending a party.

a. If c represents Nora's total charges, write an equation that expresses c in terms of g, the number of guests attending a party.

b. What is the total charge for Nora's Catering Service for 112 guests? Show all your work.

Villa Mambo's Take-Out, another catering service, charges no flat fee but charges $12 per guest attending a party.

c. If c represents Villa Mambo's total charges, write an equation that expresses c in terms of g, the number of guests attending a party.

d. The Millers plan to have a party catered, and they like Nora's Catering Service and Villa Mambo's Take-Out equally well. If they invite 112 guests, which service would cost more? Show all your work.

Write your answer to question 42 in the space provided on your answer sheet.

42 Mr. Rolands is analyzing the scores his 10 honors math students earned on their last test. To make his calculations easier, he reduced each score by 80 points and arrived at the simplified data set shown below.

$$\{0, 0, 1, 2, 4, 4, 4, 6, 7, 8\}$$

a. For each simplified data set, find each of the measures listed below. Show or explain how you got each answer.

- mean
- median
- mode
- range

b. For the set of actual scores on the math test, find each of the measures listed below. Show or explain how you got each answer.

- mean
- median
- mode
- range