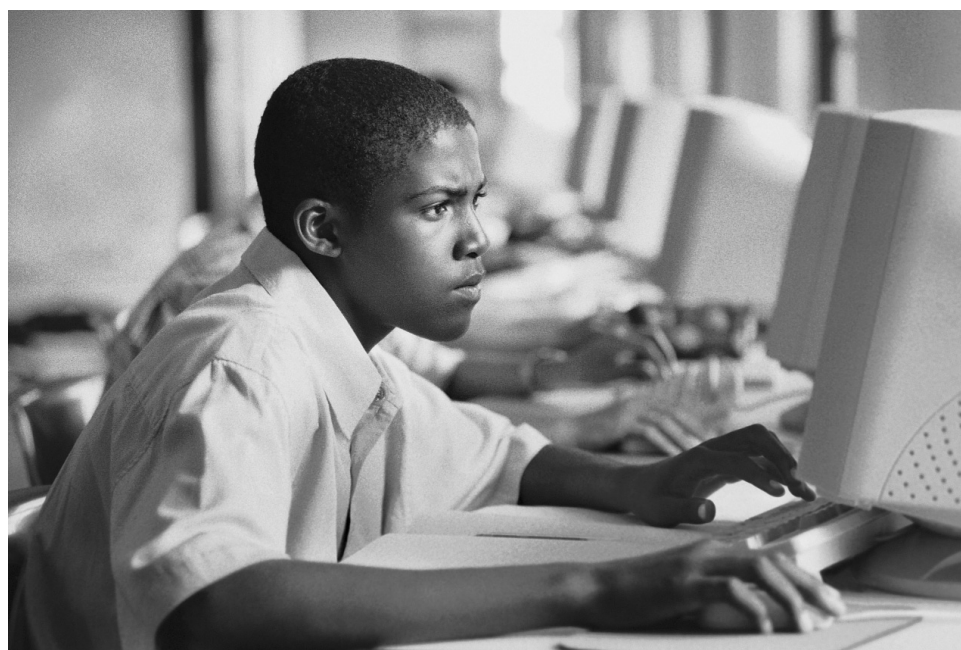




The Pennsylvania System of School Assessment

Mathematics Item and Scoring Sampler



**2008–2009
Grade 7**

MATHEMATICS

MULTIPLE-CHOICE ITEMS

During an assessment, students would not be permitted to use a calculator on items 1–4.

A.1.1.1

1. Jordan answered 80% of the questions on a test correctly. What fraction of the questions did Jordan answer correctly?

- A $\frac{1}{80}$ *80 as denominator*
- B $\frac{2}{25}$ *8/100 = 2/25*
- C $\frac{3}{4}$ *$\frac{3}{4} = 75%$; rounded up*
- D $\frac{4}{5}$ *

A.1.1.1

2. Liz had $\frac{7}{8}$ of a puzzle finished. What percent did she have finished?

- A 70% *based on numerator*
- B 87.5% *
- C 114.3% *approximately $8 \div 7$*
- D 875% *decimal placement error*

A.3.1.1

3. Which is the closest estimate of $447.777 \div 45.23$?

- A 10 *
- B 40 *445 - 45; decimal point moved left*
- C 45 *close to 45.23, 47.77*
- D 100 *decimal point moved right*

A.3.2.1

4. Multiply: $40.32 \cdot 5$

- A 20.16 *decimal point 1 place to left*
- B 21.6 *zero in tens place dropped*
- C 200.6 *1 in ones place dropped*
- D 201.6 *

MATHEMATICS

During an assessment, students would not be permitted to use a calculator on items 5 and 6.

A.3.2.1

5. Solve:

$$3\frac{5}{9} \div 2\frac{2}{3}$$

A $\frac{17}{21}$

$\frac{17}{9} \times \frac{3}{7}$

B $1\frac{1}{3}$

*

C $6\frac{2}{9}$

added

D $9\frac{13}{27}$

multiplied

A.3.2.2

6. Solve:

$$56 - (-42)$$

A -98

$-56 - 42$

B -14

$-56 + 42$

C 14

$56 - 42$

D 98

*

MATHEMATICS

A.1.2.1

Use the numbers below to answer question 7.

$$4.3 \quad 4\frac{1}{2} \quad 4\frac{1}{3} \quad 4.45 \quad 4\frac{2}{5}$$

7. What is the order of the numbers from least to greatest?

A $4\frac{1}{2} \quad 4\frac{1}{3} \quad 4\frac{2}{5} \quad 4.3 \quad 4.45$

mixed numbers ordered by denominators, then decimals

B $4.3 \quad 4.45 \quad 4\frac{1}{2} \quad 4\frac{1}{3} \quad 4\frac{2}{5}$

decimals ordered, then mixed numbers ordered by denominators

C $4\frac{1}{2} \quad 4.3 \quad 4\frac{1}{3} \quad 4.45 \quad 4\frac{2}{5}$

ordered by denominator and decimal values

D $4.3 \quad 4\frac{1}{3} \quad 4\frac{2}{5} \quad 4.45 \quad 4\frac{1}{2}$

*

A.2.1.1

8. Simplify:

$$(10 + 4) \div 2 + 32 \div 2^3$$

A $4\frac{7}{8}$

left to right; using 8 for 2^3

B $6\frac{1}{2}$

left to right; 2^3 as 6

C 11

*

D $12\frac{1}{3}$

2^3 as 6

A.1.2.2

9. Point M is graphed on the number line below.



What is the location of point M?

A $\frac{2}{3}$

point M between 2 and 3

B $1\frac{5}{9}$

point M on the 5th of 9 tick marks after 1

C $2\frac{2}{3}$

*

D $3\frac{1}{3}$

point M $\frac{1}{3}$ from 3

MATHEMATICS

A.2.2.4

10. Michael bought a 4-pound package of ground beef for \$11.56. What is the cost per pound of the ground beef?

A \$ 0.35 $4 \div 11.56, \text{rounded}$

B \$ 2.89 *

C \$ 7.56 $11.56 - 4$

D \$46.24 11.56×4

A.2.2.5

11. Carlos bought 3 gallons of ice cream for \$9.50. Which proportion can be used to find the cost of 7 gallons of ice cream?

A $\frac{3}{7} = \frac{x}{9.5}$

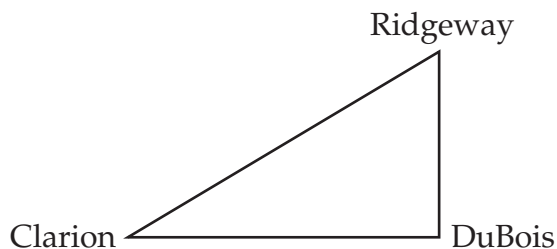
B $\frac{3}{9.5} = \frac{x}{7}$

C $\frac{7}{9.5} = \frac{x}{3}$

D $\frac{9.5}{3} = \frac{x}{7}$ *

A.2.2.6

Use the map below to answer question 12.



12. The distance from Clarion to DuBois is $2\frac{1}{2}$ inches on the map. The actual distance is 40 miles. The distance from DuBois to Ridgeway is $1\frac{1}{2}$ inches on the map. What is the actual distance, in miles, from DuBois to Ridgeway?

A $10\frac{2}{3}$ $40 \div \left(2\frac{1}{2} \times 1\frac{1}{2}\right)$

B 24 *

C 60 $40 \times 1\frac{1}{2}$

D $66\frac{2}{3}$ $40 \times \left(2\frac{1}{2} \div 1\frac{1}{2}\right)$

B.1.1.1

13. Doreen had 15 yards (yd) of string. She used 11 feet (ft) of string to tie some boxes together. What is the total length of string that Doreen has left?

A 14 yd 1 ft $1 \text{ yard regrouped as } 12 \text{ feet}$

B 11 yd 1 ft *

C 9 yd 1 ft $6 \text{ yards regrouped as } 12 \text{ feet}$

D 4 yd $15\text{yd} - 11\text{yd}$

MATHEMATICS

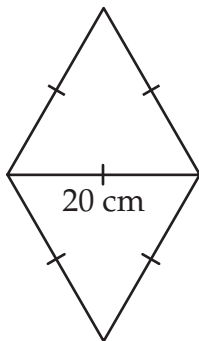
B.1.1.1

14. Mia put $2\frac{1}{2}$ gallons of milk in the refrigerator. How many pints of milk are equal to $2\frac{1}{2}$ gallons?

- A $8\frac{1}{2}$ pints *8 quarts = 2 gallons;
plus $\frac{1}{2}$*
- B 10 pints *in quarts*
- C $16\frac{1}{2}$ pints *16 pints = 2 gallons;
plus $\frac{1}{2}$*
- D 20 pints *

B.2.1.1

15. The figure below shows two equilateral triangles that share one side.

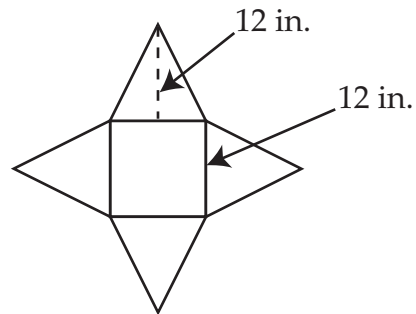


What is the perimeter of the figure?

- A 60 cm 20×3
- B 80 cm *
- C 100 cm 20×5
- D 120 cm 20×6

B.2.1.1

16. Tamiko made a paper decoration as shown below. Each side of the square is 12 inches. Each triangle has a height of 12 inches.



What is the total area of the decoration?

- A 144 sq in. *area of square*
- B 288 sq in. *area of square + 2 triangles*
- C 432 sq in. *
- D 720 sq in. *area of square + 4(bh)*

B.2.1.2

17. The radius of Hattie's circular mirror is $5\frac{1}{4}$ inches. What is the approximate circumference of her mirror?

- A 8.24 inches $r \div 2 \times 3.14$
- B 16.49 inches $r \times 3.14$
- C 32.97 inches *
- D 86.55 inches $r^2 \times 3.14$

MATHEMATICS

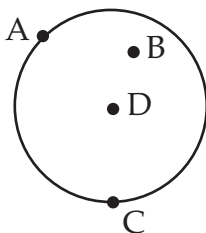
B.2.1.2

18. The radius of a circle is 8 centimeters (cm). What is the approximate circumference of the circle? (Use $\pi = 3.14$.)

- A 16 cm
- B 25 cm
- C 50 cm *
- D 201 cm

C.1.1.1

19. Oscar wants to draw a chord on the circle shown below.



Where should he draw the line segment?

- A from point A to point C *
- B from point B to point D
- C from point A to point B
- D from point D to point C

C.1.1.2

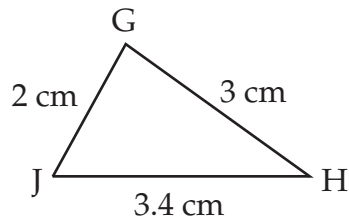
20. The diameter of a circular plate is 11.5 inches. What is the radius of the plate in inches?

- A 5.75 *
- B 11.5
- C 23
- D 34.5

MATHEMATICS

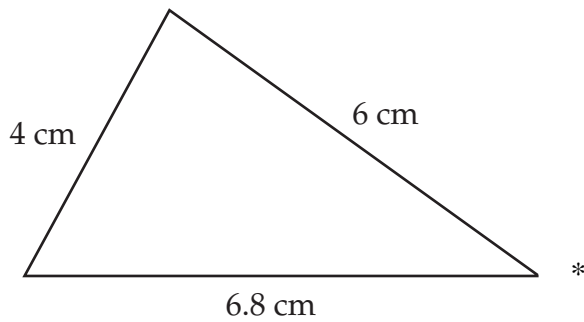
C.1.2.1

Use the triangle below to answer question 21.

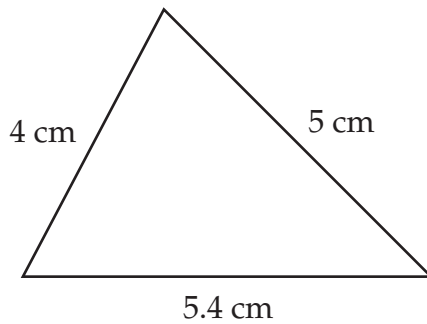


21. Which triangle is similar to triangle GHJ?

A

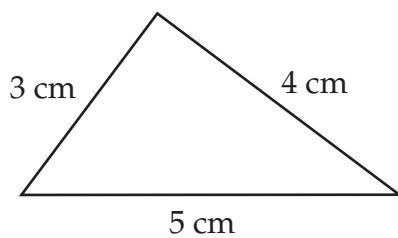


B



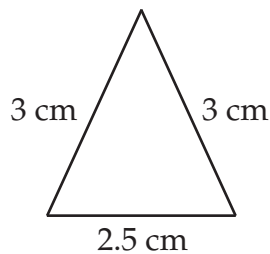
each length + 2cm

C



each length + 1cm (or more)

D



measures are close to those in $\triangle GHJ$

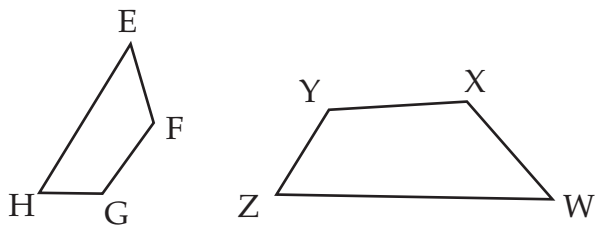
MATHEMATICS

C.1.2.1

22. Mr. Chang made 2 similar rectangular window frames. One frame was 12 feet wide and 16 feet long. What could be the dimensions of the other frame?
- A 2 feet wide and 6 feet long
 - B 6 feet wide and 8 feet long *
 - C 16 feet wide and 20 feet long
 - D 24 feet wide and 48 feet long

C.1.2.2

23. Quadrilateral EFGH is similar to quadrilateral WXYZ, as shown below.



Which segment corresponds to \overline{FG} ?

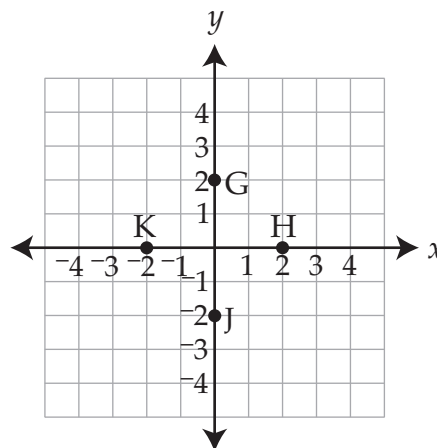
- A \overline{WX} *corresponds to \overline{EF}*
- B \overline{WZ} *corresponds to \overline{EH}*
- C \overline{YZ} *corresponds to \overline{GH}*
- D \overline{XY} *

C.1.2.2

24. Trapezoid QRST is congruent to trapezoid WXYZ. Which side corresponds to \overline{TQ} ?
- A \overline{XY}
 - B \overline{YZ}
 - C \overline{ZW} *
 - D \overline{WX}

C.3.1.1

25. Four points are graphed on the coordinate grid below.



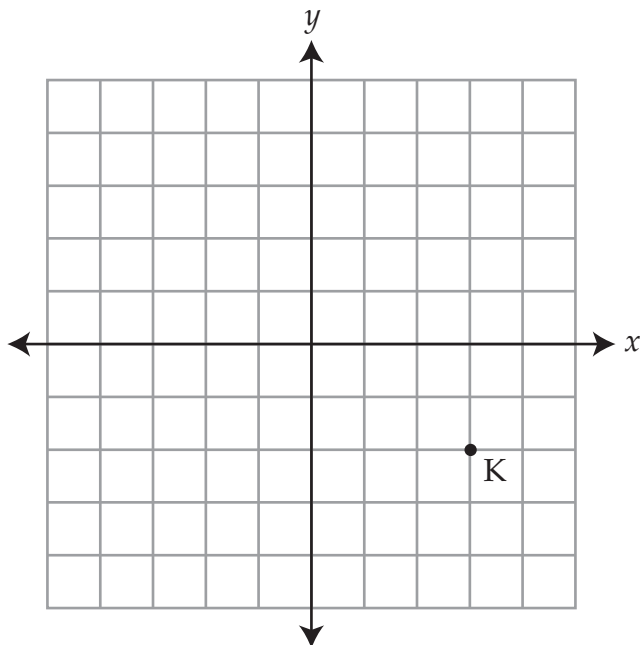
Which point represents the ordered pair (0, 2)?

- A point G *
- B point H $(2, 0)$
- C point J $(0, -2)$
- D point K $(-2, 0)$

MATHEMATICS

C.3.1.2

Use the coordinate plane below to answer question 26.



26. In which quadrant is point K located?

- A quadrant I
- B quadrant II
- C quadrant III
- D quadrant IV *

D.1.1.1

27. Students give 6 speeches. The lengths of the first four speeches are shown in the table below.

Length of Speeches

Speech	1	2	3	4
Length of Speech (in minutes)	$2\frac{1}{2}$	5	$7\frac{1}{2}$	10

The length of each speech continues to increase by the same amount. What is the length of the **6th** speech?

- A $2\frac{1}{2}$ minutes
- B 12 minutes
- C $12\frac{1}{2}$ minutes
- D 15 minutes *

MATHEMATICS

D.1.1.1

28. Devonne created the following pattern.

0.2 -0.6 1.8 -5.4 ?

The pattern continues. What is the next number in the pattern?

- A -16.2
- B -10.8
- C 10.8
- D 16.2 *

D.2.1.1

29. Dave uses the equation $15m = 165$ to calculate the amount of money (m) he earned during each hour of work. Which step should Dave use to solve the equation for m ?

- A add 15 to both sides
- B subtract 15 from both sides
- C multiply both sides by 15
- D divide both sides by 15 *

D.2.1.2

Use the expression below to answer question 30.

$$x^3 + 40 \div y - (10 + 3)$$

30. What is the value of the expression when $x = 4$ and $y = 8$?

- A 0
- B 4
- C 56 *
- D 62

D.2.1.2

31. The formula below is used to convert Fahrenheit ($^{\circ}\text{F}$) temperatures to Celsius.

$$^{\circ}\text{C} = 10(^{\circ}\text{F} - 32) \div 18$$

The temperature outside is 41°F . What is this temperature in degrees Celsius ($^{\circ}\text{C}$)?

- A 5 *
- B 21
- C 50
- D 56

MATHEMATICS

D.2.2.1

32. Kevin heard that the overnight temperature (t) would not rise above 32°F . Which statement represents the overnight temperature in $^{\circ}\text{F}$?

- A $t \leq 32$ *
- B $t < 32$
- C $t = 32$
- D $t \geq 32$

D.2.2.1

33. The amount of money Margaret has is twice the amount Emily has plus \$5. The amount of money Emily has is e . Which expression describes Margaret's amount of money?

- A $\frac{e}{2} - 5$
- B $\frac{e}{2} + 5$
- C $2e - 5$
- D $2e + 5$ *

D.3.1.1

34. Li can type 170 words every 2 minutes. How many words should Li be able to type in 5 minutes?

- A 34
- B 85
- C 425 *
- D 850

D.3.1.1

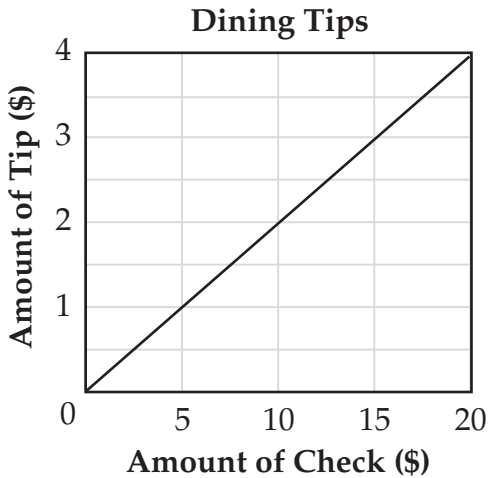
35. A radio station plays 15 songs each hour. At this rate, how many hours will it take the radio station to play 75 songs?

- A 5 *
- B 60
- C 90
- D 1,125

MATHEMATICS

D.3.1.2

Use the line graph below to answer question 36.



36. Jacob went out to eat at many restaurants. He graphed the total cost of each meal and the amount of money he gave for a tip. Which describes the rate at which the amount of the tip changed?

A It increased \$1 for every \$1 increase in the amount of the check.

interval change on x-axis as 1

B It increased \$4 for every \$1 increase in the amount of the check.

greatest y value

C It increased \$1 for every \$5 increase in the amount of the check.

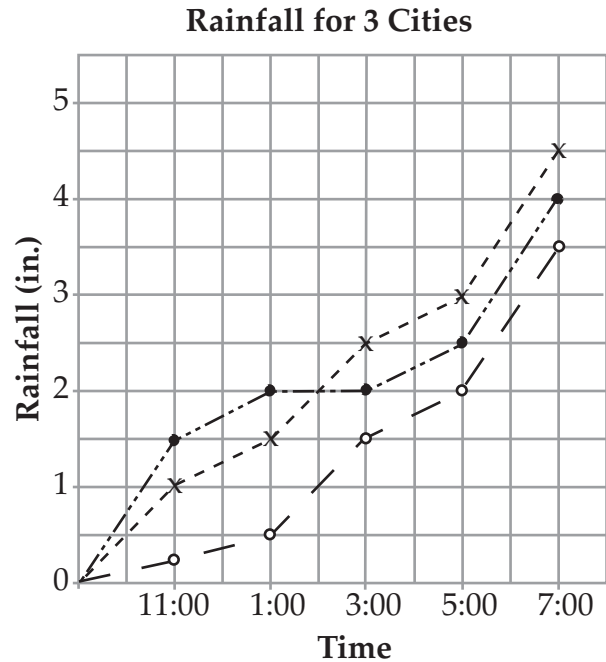
*

D It increased \$5 for every \$1 increase in the amount of the check.

reversed variables

E.1.1.1

37. The rainfall for 3 cities is graphed below. At what time was the total of the rainfall for the 3 cities approximately 4 inches?



Key	
City A	— ○
City B	- - - x
City C	- · - · ●

A 1:00 *

B 3:00

C 5:00

D 7:00

MATHEMATICS

E.2.1.1

38. The monthly rents for 10 units of an apartment building are shown in the table below.

Monthly Rents

Apartment Number	Rent (\$)
1	650
2	750
3	750
4	750
5	750
6	875
7	900
8	925
9	925
10	2,900

What is the mode of the rents at the apartment building?

- A 750.00 *
- B 812.50 *median*
- C 1017.50 *mean*
- D 2250.00 *range*

E.3.1.1

39. A bowl contains 13 cards numbered 1 to 13. Josh randomly selects 1 card from the bowl. What is the probability the card has an even number on it?

- A $\frac{6}{13}$ *
- B $\frac{1}{2}$ $\frac{1}{2}$ even, $\frac{1}{2}$ odd
- C $\frac{7}{13}$ *probability odd*
- D $\frac{6}{7}$ *even to odd*

MATHEMATICS

E.3.1.1

40. A restaurant display case has the following tea bag selections.

Tea Bags

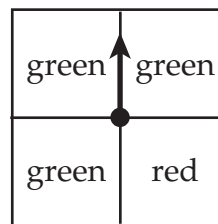
Flavor	Number
black tea	15
cinnamon	10
green tea	15
lemon	4
raspberry	6

What is the probability that a tea bag randomly selected from the case will be cinnamon?

- A $\frac{1}{50}$ 1 bag in 50
- B $\frac{1}{10}$ 1 of 10 cinnamon
- C $\frac{1}{5}$ *
- D $\frac{1}{4}$ 10 cinnamon/40 others

E.3.1.2

Use the spinner below to answer question 41.



41. The arrow on the spinner is spun once. What is the probability the arrow on the spinner does **not** stop on green?

- A $\frac{1}{4}$ *
- B $\frac{1}{3}$ 1 red and 3 green
- C $\frac{2}{3}$ opposite of option B
- D $\frac{3}{4}$ probability of green

MATHEMATICS

E.3.1.3

42. Marbles were randomly drawn from a bag one by one. After each draw, the color was recorded, the marble was returned to the bag, and then the next marble was drawn. The results are recorded below.

Marbles

Color	Number in Bag	Number Drawn
black	10	8
green	50	45
purple	5	2
red	20	25
yellow	15	20

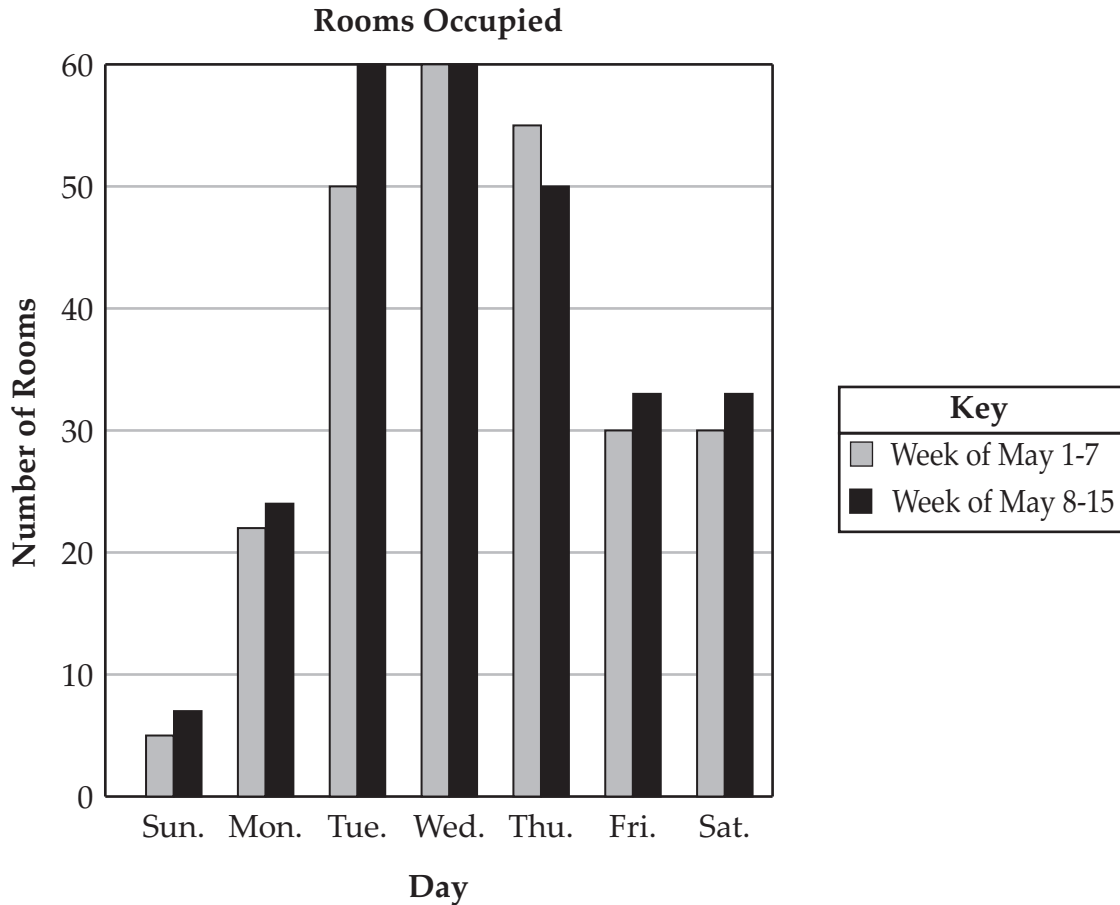
What is the **experimental** probability that a marble randomly drawn from the bag will be red?

- A $\frac{1}{25}$ *1 of 25 drawn*
- B $\frac{1}{5}$ *theoretical probability*
- C $\frac{1}{4}$ *
- D $\frac{1}{3}$ *25 red drawn/others*

MATHEMATICS

E.4.1.1

43. A motel desk clerk made a graph to show the number of rooms occupied each day for 2 weeks starting Sunday, May 1.



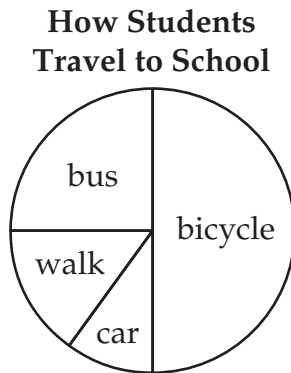
Based on the graph, which day had an occupancy of 55 rooms?

- A Tuesday, May 3
- B Thursday, May 5 *
- C Tuesday, May 10
- D Thursday, May 12

MATHEMATICS

E.4.1.1

44. The circle graph below shows how the students at Lakeland Middle School travel to school.



There are 500 students who attend Lakeland Middle School. Based on the circle graph, how many of those students travel to school by bicycle?

- A 50 students

$$50\% \text{ of graph} = 50 \text{ students}$$

- B 125 students

$$1 \text{ out of 4 options} = 25\%; \\ 0.25 \times 500$$

- C 250 students

*

- D 450 students

$$500 - 50$$

MATHEMATICS

FIRST OPEN-ENDED ITEM

A.3

45. A total of 8,000 runners started a long distance race. The results of the race are listed below.

- $\frac{3}{16}$ of the runners finished the race in less than 4 hours.
- 0.65 of the runners finished the race in 4 or more hours.
- The rest of the runners did **not** finish the race.

A. Calculate the number of runners who finished the race in less than 4 hours.
Show all your work.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

45. *Continued.* Please refer to the previous page for task explanation.

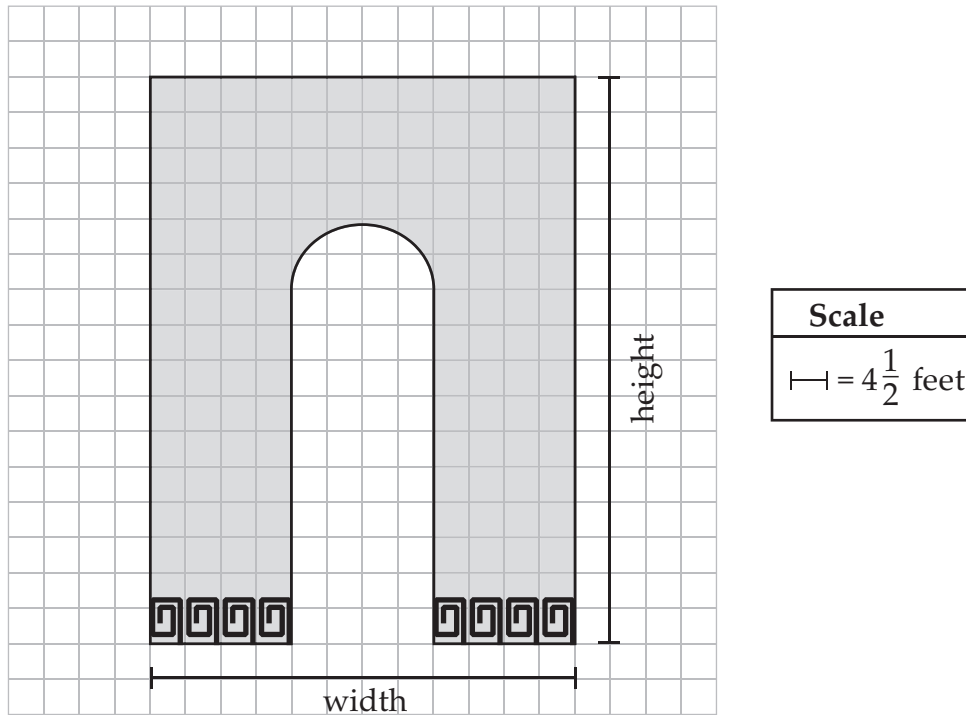
- B.** Calculate the number of runners who did **not** finish the race. Show all your work. Explain why you did each step.

MATHEMATICS

SECOND OPEN-ENDED ITEM

B.2

46. An architect made a scale drawing on a grid of the front of an arch for a public park.



- A. What will be the actual width and height, in feet, of the arch?
Show or explain all your work.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

46. *Continued.* Please refer to the previous page for task explanation.

B. The architect wanted to make another scale drawing of the arch based on its actual height and width. The drawing of the arch had to measure 4 inches by 3 inches to fit on a card. What scale should the architect use for this drawing? Show or explain all your work.

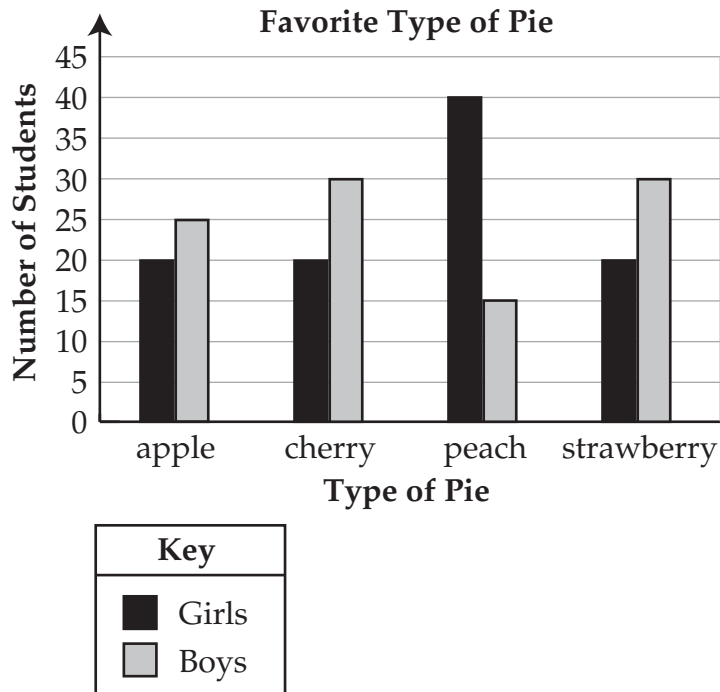
C. The architect planned to enlarge the arch for a project in another city. The larger arch was to be $1\frac{1}{4}$ the size of the original. What will be the width and height, in feet, of the larger arch? Show or explain all your work.

MATHEMATICS

THIRD OPEN-ENDED ITEM

E.1

47. Mr. Oakley's class surveyed 200 students about their favorite type of pie. The double bar graph below shows the results of the survey.



- A. What is the difference in the total number of students who chose **peach** pie as their favorite type of pie and the total number of students who chose **apple** pie? Show all your work. Explain why you did each step.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

47. *Continued.* Please refer to the previous page for task explanation.

- B.** What fraction of the **boys** surveyed chose **cherry** pie as their favorite type of pie? Show all your work. Explain why you did each step.

MATHEMATICS

FOURTH OPEN-ENDED ITEM

E.2

48. A new building contains 10 rental apartments. The apartments vary in size. The monthly rental charges for the apartments are shown in the table below.

Apartment Rental Charges

Apartment	Monthly Rent
A	\$ 480
B	\$ 360
C	\$ 600
D	\$ 480
E	\$1,800
F	\$ 720
G	\$ 600
H	\$ 480
I	\$3,600
J	\$ 540

- A. Find the **mode** and **median** monthly rents. Show or explain all your work.

Mode: _____

Median: _____

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

48. *Continued.* Please refer to previous page for task explanation.

- B.** The builder plans to advertise using one statistical measurement that gives a fair representation of the monthly apartment rents. He will use the mean. Find the **mean** (average) rental. Show or explain all your work.

Explain why the **mean** does not fairly represent the monthly apartment rents.