VIRGINIA STANDARDS OF LEARNING

GRADE 6
MATHEMATICS

2023 Mathematics Standards of Learning

Practice Item Set

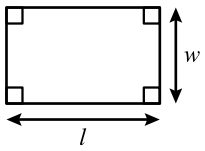
Printed in the United States of America.

Questions 1–4 are in the non-calculator section. Questions in this section may not be answered with a calculator.

Questions 5–23 are in the calculator section. A calculator may be used with questions in this section.

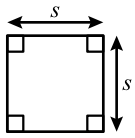
Middle School Mathematics Formula Sheet
2023 *Mathematics Standards of Learning*

Geometric Formulas



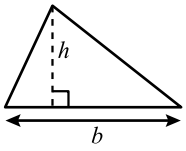
$p = 2l + 2w$

$A = lw$

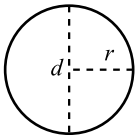


$p = 4s$

$A = s^2$



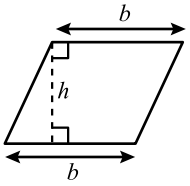
$A = \frac{1}{2}bh$



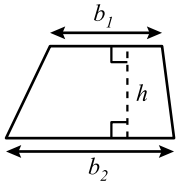
$C = 2\pi r$

$C = \pi d$

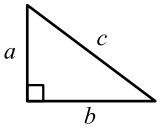
$A = \pi r^2$



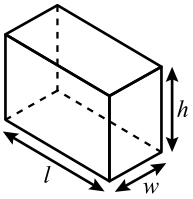
$A = bh$



$A = \frac{1}{2}h(b_1 + b_2)$



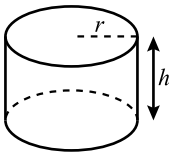
$a^2 + b^2 = c^2$



$V = lwh$

$V = Bh$

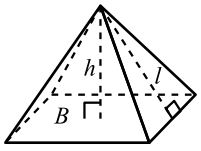
$S.A. = 2lw + 2lh + 2wh$



$V = \pi r^2 h$

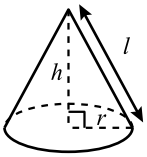
$V = Bh$

$S.A. = 2\pi r^2 + 2\pi rh$



$V = \frac{1}{3}Bh$

$S.A. = \frac{1}{2}lp + B$



$V = \frac{1}{3}\pi r^2 h$

$V = \frac{1}{3}Bh$

$S.A. = \pi r^2 + \pi rl$

Abbreviations

milligram	mg
gram	g
kilogram	kg
milliliter	mL
liter	L
kiloliter	kL
millimeter	mm
centimeter	cm
meter	m
kilometer	km
square centimeter	cm^2
cubic centimeter	cm^3

ounce	oz
pound	lb
quart	qt
gallon	gal.
inch	in.
foot	ft
yard	yd
mile	mi.
square inch	sq in.
square foot	sq ft
cubic inch	cu in.
cubic foot	cu ft

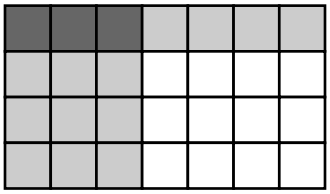
Area	A
Area of Base	B
Circumference	C
Perimeter	p
Surface Area	$S.A.$
Volume	V

Pi

$\pi \approx 3.14$

$\pi \approx \frac{22}{7}$

1 Which expression is best represented by this model?



A $\frac{1}{7} \bullet \frac{1}{4}$

B $\frac{3}{7} \bullet \frac{1}{4}$

C $\frac{1}{7} \bullet \frac{3}{4}$

D $\frac{3}{7} \bullet \frac{3}{4}$

2 What is the product of $2\frac{2}{3}$ and $1\frac{1}{6}$?

F $2\frac{1}{9}$

G $2\frac{2}{7}$

H $3\frac{1}{9}$

J $3\frac{5}{6}$

3 **The value of $8\frac{1}{4} \div \frac{1}{8}$ is —**

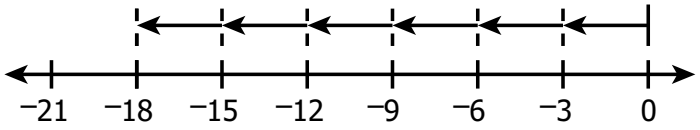
A greater than $8\frac{1}{4}$ because the dividend is greater than the divisor.

B greater than $8\frac{1}{4}$ because the divisor is a value between 0 and 1.

C less than $8\frac{1}{4}$ because the divisor is less than the dividend.

D less than $8\frac{1}{4}$ because the quotient is always less than the dividend.

4 **Which equation is represented by this model?**



F $^{-}3 \bullet 6 = {}^{-}18$

G $^{-}3 \bullet 6 = 18$

H $^{-}3 \bullet (^{-}6) = {}^{-}18$

J $3 \bullet (^{-}6) = 18$

The non-calculator section of the practice item set ends here.

A calculator may be used with questions in the next section.

5 Which number is less than $^{-}8$?

A $^{-}10$
B $^{-}3$
C 6
D 14

6 Which statement best describes a number that is a perfect square?

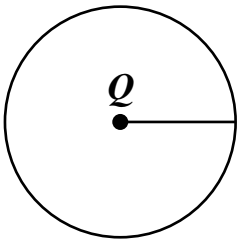
F 3 is a perfect square because $3^2 = 9$
G 11 is a perfect square because $11 \bullet 2 = 22$
H 36 is a perfect square because $6^2 = 36$
J 40 is a perfect square because $4 \bullet 10 = 40$

7 Nigel has 3 rolls of ribbon. Each roll has $8\frac{3}{4}$ feet of ribbon. It takes $1\frac{3}{4}$ feet of ribbon to make one bow. What is the total number of bows that Nigel can make using these 3 rolls of ribbon?

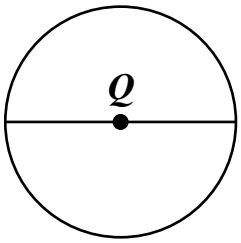
A 5 bows
B 15 bows
C 31 bows
D 46 bows

8 Wayne and Dani both drew congruent circles and marked the center points as Q. They each drew a line segment inside their circle as shown.

Wayne's Circle



Dani's Circle



Which statement best describes the line segments in Wayne's and Dani's circles?

F Wayne's line segment shows a diameter, and Dani's line segment shows a radius.

G Wayne's line segment shows a radius, and Dani's line segment shows a diameter.

H Wayne's line segment shows a diameter, and Dani's line segment shows a chord.

J Wayne's line segment shows a chord, and Dani's line segment shows a diameter.

9 The diameter of the circular base of a storage container is 18.8 meters. The circumference of the base is approximately 59 meters. Which of these could be used to approximate the value of π ?

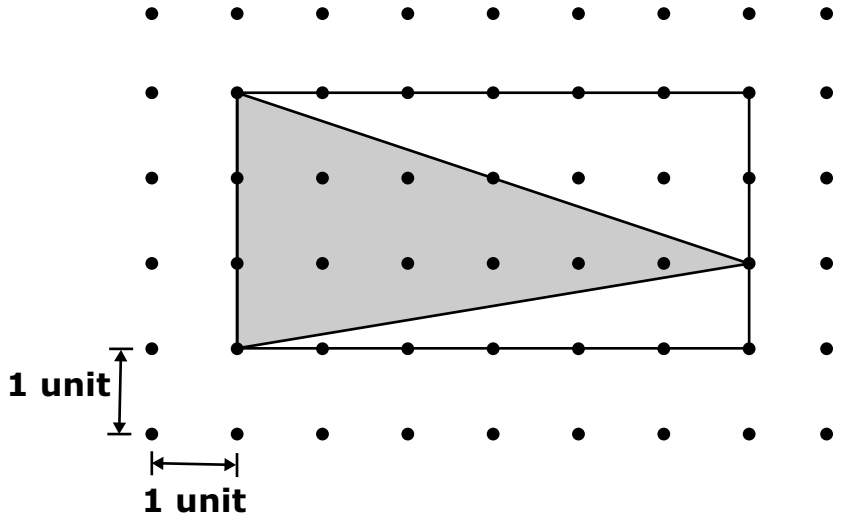
A $\frac{9.4}{59}$

B $\frac{59}{9.4}$

C $\frac{18.8}{59}$

D $\frac{59}{18.8}$

10 The rectangle and shaded triangle have the same base and height, as shown in the diagram.



The area, in square units, of the shaded triangle can be represented as —

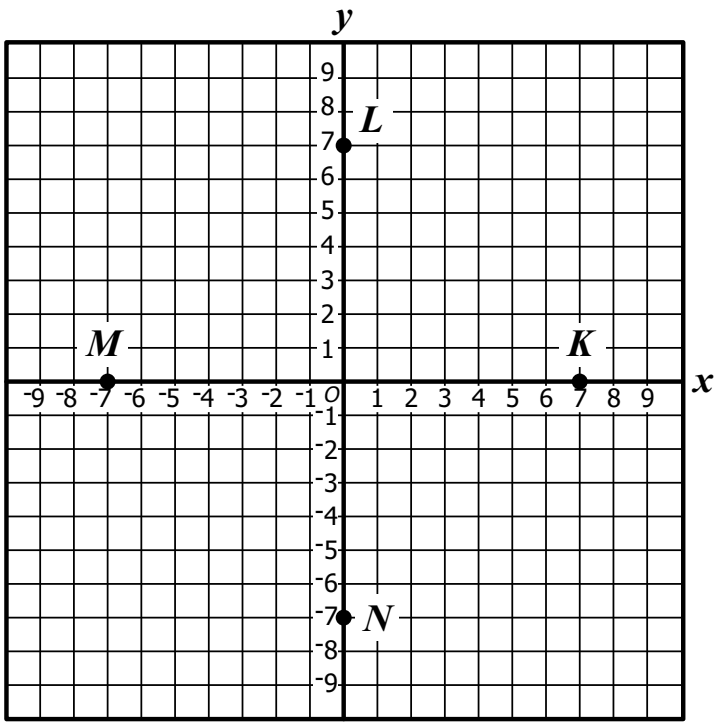
F $3 \bullet 6$

G $0.5 \bullet 3 \bullet 6$

H $0.5 \bullet 3 \bullet 3$

J $0.5 \bullet 1.5 \bullet 6$

11 Which graphed point is best represented by $(^{-}7, 0)$?



A Point K

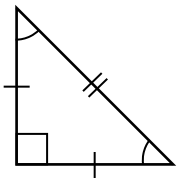
B Point L

C Point M

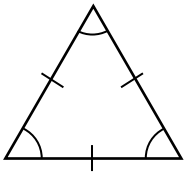
D Point N

12 Which figure represents a regular polygon?

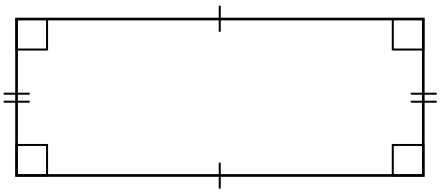
F



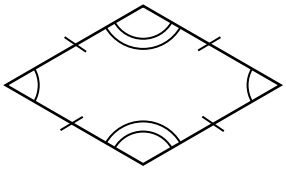
H



G



J



13 A class will collect data to determine which afterschool event is the favorite for students to attend. Which method would result in data most representative of the entire school population?

A Post an online survey on the school website.

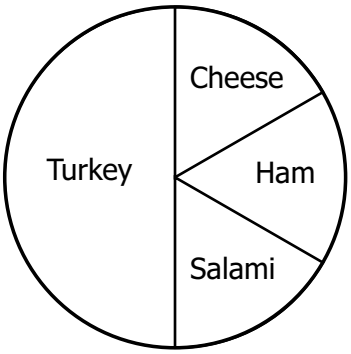
B Survey all the students who attend the next afterschool event.

C Poll all the students in the sixth-grade English classes.

D Survey every fifth student who enters the cafeteria during each lunch period.

14 Timothy ordered 150 sandwiches on Monday. This circle graph represents the number of each kind of sandwich he ordered.

Sandwiches Ordered

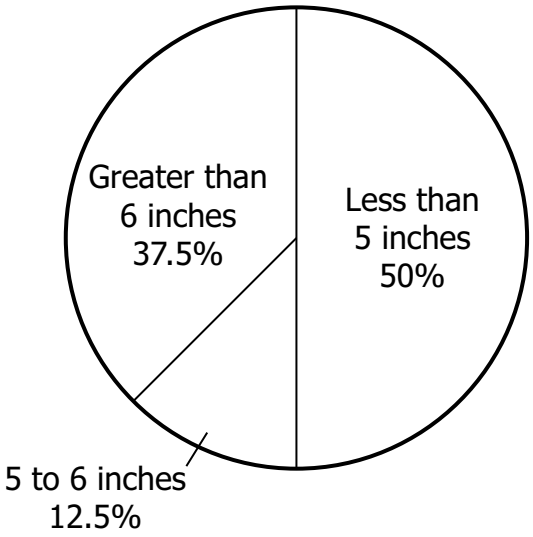


Which is closest to the total number of turkey sandwiches Timothy ordered?

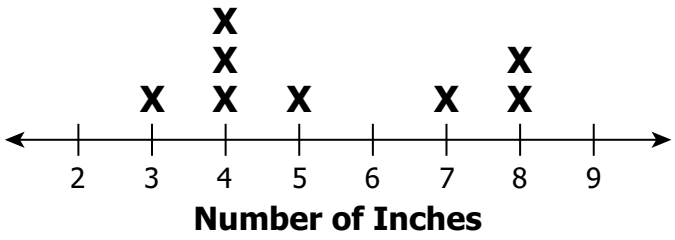
F 25
G 38
H 50
J 75

15 Porter recorded the lengths of 8 earthworms. Each length is rounded to the nearest inch. The circle graph and the line plot represent this set of data.

Lengths of Earthworms



Lengths of Earthworms



Number of Inches

Each **X** represents 1 earthworm.

What information can be determined from both the circle graph and the line plot?

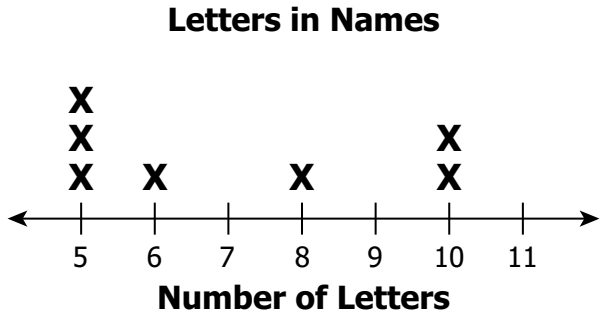
A The mode of the data set

B The range of the data set

C The percent of earthworms greater than 6 inches long

D The number of earthworms that are exactly 5 inches long

16 This line plot shows the number of letters in the names of 7 students.



Each **X** represents 1 student.

What is the balance point for this set of data?

F 5 letters
G 6 letters
H 7 letters
J 8 letters

Directions: Use the following information to answer questions 17–18.

The table shows the number of minutes 10 students each used completing homework one night.

Minutes Completing Homework

Student	Ava	Brady	Claire	Cole	Eli	Emily	Henry	Ian	Julia	Lily
Time (minutes)	65	45	50	80	45	50	65	15	85	50

17 The teacher removes the outlier from the data and recalculates the measures of center and spread. When the outlier is removed from the data, the —

A median decreases

B range increases

C mean increases

D mode increases

18 Cole used —

- **$\frac{1}{5}$ of his time reading his notes**
- **$\frac{1}{4}$ of his time completing problems**

He used the rest of his time reviewing his textbook. Cole reviewed his textbook for exactly —

F 20 min

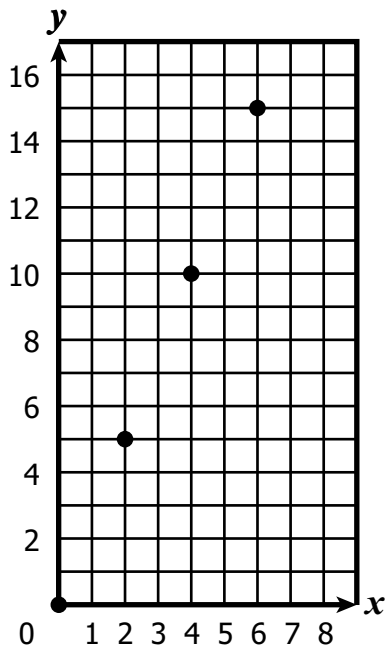
G 36 min

H 44 min

J 53 min

End of Set

19 The points on the coordinate plane show the proportional relationship between the x- and y-values.



Which table of values represents the same proportional relationship that is shown in the graph?

A

x	y
3	7.5
5	12.5
9	22.5

B

x	y
4	2
6	4
8	6

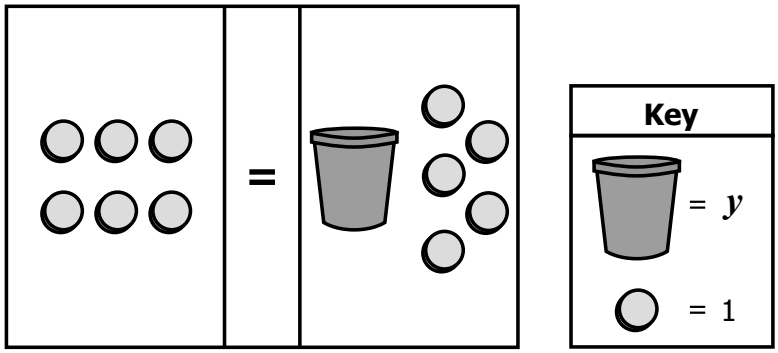
C

x	y
3	1.2
5	2.0
9	3.6

D

x	y
4	5
6	10
8	15

20 Using the key shown, look at this equation mat.



Which equation best represents the equation mat shown?

F $y = 5 + 6$
G $y + 5 = 6$
H $y \div 5 = 6$
J $y = 6$

21 What is the value of m for this equation?

$$\mathbf{18} = \frac{m}{\mathbf{6}}$$

A $\frac{1}{3}$

B 3

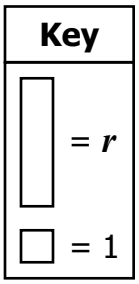
C 12

D 108

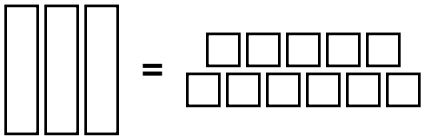
22 Mr. Hansen wrote and solved this equation on the board.

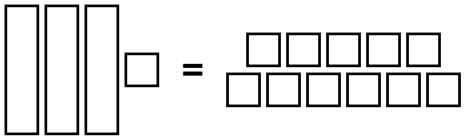
$$r + 3 = 11$$
$$r + (3 - 3) = 11 - 3$$
$$r = 8$$

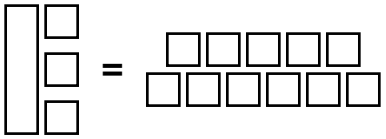
He used the key shown and drew a model to confirm the solution.

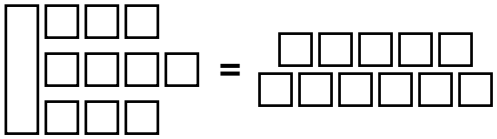


Which of these best represents a model Mr. Hansen could use to confirm his solution?

F 

H 

G 

J 

23 Which statement is true?

A -2 is a solution to $x < -3$ because $-2 < 3$

B -5 is a solution to $x \leq -10$ because $5 < 10$

C -10 is a solution to $x > -10$ because $-10 = -10$

D -12 is a solution to $x \geq -12$ because $-12 = -12$

Grade 6 Mathematics
Practice Item Set Spring 2025
Answer Key

Sequence Number	Correct Answer	Reporting Category	Reporting Category Description
1	B	002	Computation and Estimation
2	H	002	Computation and Estimation
3	B	002	Computation and Estimation
4	F	002	Computation and Estimation
5	A	001	Number and Number Sense
6	H	001	Number and Number Sense
7	B	002	Computation and Estimation
8	G	003	Measurement and Geometry
9	D	003	Measurement and Geometry
10	G	003	Measurement and Geometry
11	C	003	Measurement and Geometry
12	H	003	Measurement and Geometry
13	D	004	Probability, Statistics, Patterns, Functions, and Algebra
14	J	004	Probability, Statistics, Patterns, Functions, and Algebra
15	C	004	Probability, Statistics, Patterns, Functions, and Algebra
16	H	004	Probability, Statistics, Patterns, Functions, and Algebra
17	C	004	Probability, Statistics, Patterns, Functions, and Algebra
18	H	002	Computation and Estimation
19	A	004	Probability, Statistics, Patterns, Functions, and Algebra
20	G	004	Probability, Statistics, Patterns, Functions, and Algebra
21	D	004	Probability, Statistics, Patterns, Functions, and Algebra
22	G	004	Probability, Statistics, Patterns, Functions, and Algebra
23	D	004	Probability, Statistics, Patterns, Functions, and Algebra

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