2021-2022 Item and Scoring Samplers

(Due to the cancellation of standardized testing in 2019–2020, the 2021 Item and Scoring Samplers are revised and enhanced versions of the previously released 2017 Item and Scoring Samplers.

PSSA Grade 4 Mathematics Item Sampler 2021

General Description of Scoring Guidelines for Mathematics Open-Ended Questions

4—The response demonstrates a *thorough* understanding of the mathematical concepts and procedures required by the task.

The response provides correct answer(s) with clear and complete mathematical procedures shown and a correct explanation, as required by the task. Response may contain a minor "blemish" or omission in work or explanation that does not detract from demonstrating a *thorough* understanding.

3—The response demonstrates a *general* understanding of the mathematical concepts and procedures required by the task.

The response and explanation (as required by the task) are mostly complete and correct. The response may have minor errors or omissions that do not detract from demonstrating a *general* understanding.

2—The response demonstrates a *partial* understanding of the mathematical concepts and procedures required by the task.

The response is somewhat correct with *partial* understanding of the required mathematical concepts and/or procedures demonstrated and/or explained. The response may contain some work that is incomplete or unclear.

1—The response demonstrates a *minimal* understanding of the mathematical concepts and procedures required by the task.

0—The response has no correct answer and *insufficient* evidence to demonstrate any understanding of the mathematical concepts and procedures required by the task for that grade level.

Response may show only information copied from the question.

Special Categories within zero reported separately:

BLK (blank).....Is blank, is entirely erased, or gives a written refusal to respond

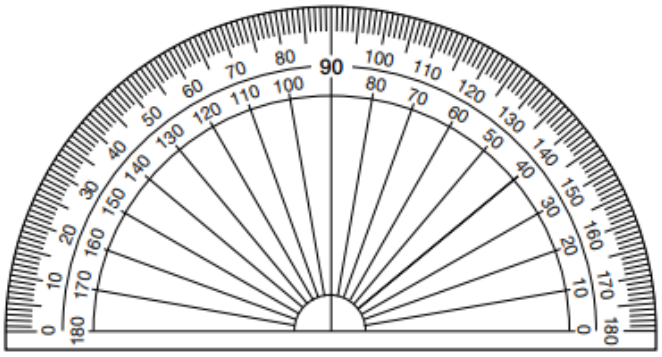
OT.....Is off-task

LOE.....Is in a language other than English

IL.....Is illegible

Grade 4 Protractor

The protractor shown below is not intended to be used to measure. It has been included as a representation of the protractors that will be provided for students when they take the test. Due to differences in printers, the protractor in this sampler may not accurately reproduce to scale.



Grade 4 Formula Sheet

Formulas and conversions that you may need on this test are found below.
You may refer back to this page at any time during the mathematics test.

2021
Grade 4

Standard Conversions

1 yard (yd) = 3 feet (ft)
1 foot = 12 inches (in.)

1 pound (lb) = 16 ounces (oz.)

1 gallon (gal) = 4 quarts (qt)
1 quart = 2 pints (pt)
1 pint = 2 cups (c)

Metric Conversions

1 kilometer (km) = 1,000 meters (m)
1 meter = 100 centimeters (cm)

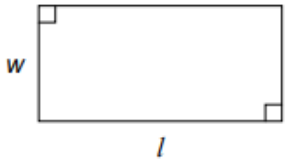
1 kilogram (kg) = 1,000 grams (g)

1 liter (L) = 1,000 milliliters (mL)

Time Conversions

1 year (yr) = 12 months (mo)
1 year = 52 weeks (wk)
1 year = 365 days
1 week = 7 days
1 day = 24 hours (hr)
1 hour = 60 minutes (min)
1 minute = 60 seconds (sec)

Rectangle



Area = length × width
$A = l \times w$

Perimeter = length + length + width + width
$P = l + l + w + w$

Question 1 in this sampler is to be solved without the use of a calculator.

MULTIPLE-CHOICE ITEMS

1. Add: $6\frac{2}{5} + 3\frac{4}{5}$

A. $4\frac{4}{5}$

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

C. $10\frac{1}{5}$

D. $21\frac{1}{5}$

A calculator is permitted for use in solving questions 2–17 in this sampler.

2. There are 49,528 people living in a city. What is the value of the 4 in the number of people living in the city?

A. two times the two in the tens place

B. twenty times the two in the tens place

C. two hundred times the two in the tens place

D. two thousand times the two in the tens place

3. The average distance from Earth to the moon is 238,855 miles. What is this distance rounded to the nearest thousand?

A. 200,000

B. 238,000

C. 238,900

D. 239,000

4. A theater sold $1,048 worth of tickets on Saturday and $424 worth of tickets on Sunday. Each ticket cost $8. How many tickets were sold altogether on Saturday and Sunday?

A. 53

B. 78

C. 131

D. 184

5. Cheryl keeps her marbles in two containers. She has between 177 and 203 marbles in one container. She has between 157 and 163 marbles in the other container. Which estimate could be the total number of marbles Cheryl has in both containers?

A. 300

B. 320

C. 360

D. 400

6. On a vocabulary list, $\frac{5}{10}$ of the words are nouns and $\frac{6}{12}$ of the words are verbs. Which pair of statements correctly compares the fraction of the words on the vocabulary list that are nouns to the fraction that are verbs?

A. Since $5 < 6$, then $\frac{5}{10} < \frac{6}{12}$.
So, there are fewer nouns than verbs on the vocabulary list.

B. Since $\frac{1}{10} > \frac{1}{12}$, then $\frac{5}{10} > \frac{6}{12}$.
So, there are more nouns than verbs on the vocabulary list.

C. Since $\frac{5}{10} = \frac{7}{12}$ and $7 > 6$, then $\frac{5}{10} > \frac{6}{12}$.
So, there are more nouns than verbs on the vocabulary list.

D. Since $\frac{5}{10} = \frac{1}{2}$ and $\frac{6}{12} = \frac{1}{2}$, then $\frac{5}{10} = \frac{6}{12}$.
So, there are equal numbers of nouns and verbs on the vocabulary list.

7. In September, Mrs. Jones had a full set of pencils. In October, she had $\frac{7}{12}$ of the full set remaining. In November, she gave away $\frac{2}{12}$ of the full set. What fraction of the full set of pencils did Mrs. Jones have remaining at the end of November?

A. $\frac{5}{24}$

B. $\frac{5}{12}$

C. $\frac{5}{6}$

D. $\frac{5}{0}$

8. Mikalya rode her bike on 4 days last week. She rode her bike a total of $2\frac{2}{3}$ miles. Which equation shows how many miles Mikalya could have ridden her bike each day?

A. $\frac{1}{3} + \frac{1}{3} + 1 + 1 = 2\frac{2}{3}$

B. $\frac{2}{3} + \frac{2}{3} + 1 + 1 = 2\frac{2}{3}$

C. $\frac{1}{3} + \frac{1}{3} + \frac{2}{3} + 1 = 2\frac{2}{3}$

D. $\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + 1 = 2\frac{2}{3}$

9. In each box of bananas, $\frac{2}{10}$ of the bananas are already ripe. How many bananas are already ripe in a box of 30 bananas?

A. 2

B. 6

C. 12

D. 20

10. Pauline has two sticks. One is $\frac{4}{10}$ meter long. The other is $\frac{9}{100}$ meter long. Which statement correctly compares the two lengths when written as decimals?

A. $0.04 < 0.09$

B. $0.04 < 0.90$

C. $0.90 < 0.40$

D. $0.09 < 0.40$

11. Jesse has 4 rows of rocks. There are 6 rocks in each row. Which description shows another way Jesse can organize all of his rocks?

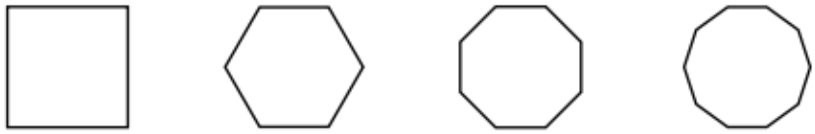
A. 2 rows with 5 rocks in each row

B. 3 rows with 8 rocks in each row

C. 5 rows with 5 rocks in each row

D. 2 rows with 24 rocks in each row

12. The shapes below show a pattern.



shape 1 shape 2 shape 3 shape 4

The pattern continues. How many sides will shape 10 have?

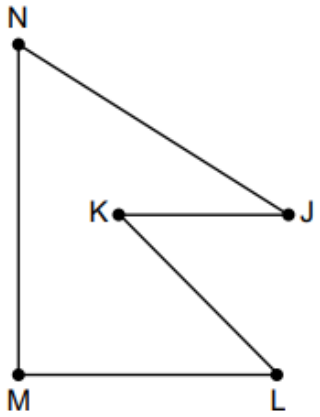
A. 16

B. 22

C. 30

D. 40

13. The shape of Nepal's flag is shown below.



Which statement about the shape of Nepal's flag is true?

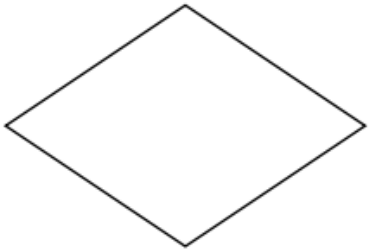
A. Angle N is a right angle.

B. Angle J is an obtuse angle.

C. Line segment ML and line segment KJ are parallel.

D. Line segment ML and line segment KL are perpendicular.

14. The shape of a window in Neal's house is shown below.



The opposite sides of the window are parallel. No pair of sides is perpendicular. Which term describes the shape of the window?

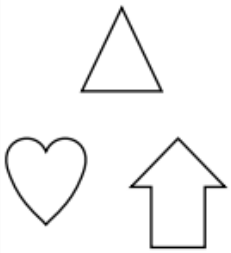
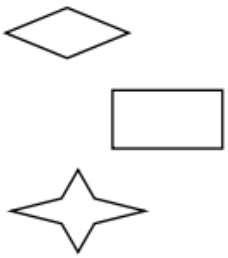
A. parallelogram

B. rectangle

C. square

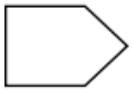
D. trapezoid

15. Erin sorted some shapes based on the number of lines of symmetry each shape has.

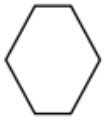
Group A	Group B
	

Which shape belongs in Group B?

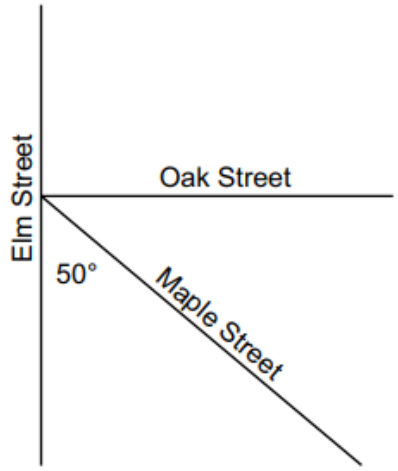
A. 

B. 

C. 

D. 

16. On the street map shown below, Elm Street and Oak Street meet at a right angle.



Which equation shows how to find the measure of the angle formed by Maple Street and Oak Street?

A. $90° - 50° = 40°$

B. $180° - 50° = 130°$

C. $90° + 50° = 140°$

D. $180° + 50° = 230°$

OPEN-ENDED QUESTION

17. A construction crew is paving a highway.

One morning, the crew starts work at 10 minutes past 6 A.M. and finishes at 20 minutes to noon.

A. How many hours and minutes does the crew work in the morning?

The crew can extend the length of the highway by 200 feet each hour.

B. What is the length, in feet, of the new part of the highway when the crew finishes working in the morning? Show or explain all your work.

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

After lunch, the crew will extend the length of the highway by another 300 **yards**. They will start at 1:30 P.M.

C. At what time will they complete the 300 **yards**?