2021-2022

NSCAS NEBRASKA STUDENT-CENTERED ASSESSMENT SYSTEM

Grade 7 - Item Type Sampler
Mathematics

Directions:

On the following pages of your booklet are questions for the Grade 7 *Nebraska Student-Centered Assessment System Mathematics (NSCAS-M)* Item Type Sampler.

Read these directions carefully before beginning the item type sampler.

This item type sampler will include several different types of questions. Multiple choice questions will ask you to select an answer from among four choices. Multiple select questions will ask you to select multiple correct answers from among five or more choices. For some questions, there may be two parts, Part A and Part B, where each part has a multiple choice or multiple select question. These questions will be found in your item type sampler.

For all questions:

• Read each question carefully and choose the best answer.
• You may use scratch paper to solve the problems.
• The Mathematics Reference Sheet is provided in the back of the Mathematics section. You may refer to this page at any time during the sampler.
• You may use a calculator ONLY for questions 1–6. You may NOT use a calculator for any other questions on this sampler.
• Be sure to answer ALL the questions.

When you come to the word STOP at the end of Part 1, you have finished Part 1 of the Grade 7 NSCAS Growth Mathematics Item Type Sampler. You may review ONLY Part 1 to check your answers. Your calculator must be collected before you can continue with Part 2. When your calculator has been collected, and your proctor has given you permission, you may move on to Part 2.

When you are finished with Part 2, you may review ONLY Part 2 to check your answers.

# NSCAS — NEBRASKA STUDENT-CENTERED ASSESSMENT SYSTEM

Mathematics Reference Sheet

Shape	Area	Circumference
Circle	$A = \pi r^2$	$C = \pi d = 2\pi r$
Triangle	$A = \frac{1}{2}bh$	**Perimeter**
Rectangle	$A = l \times w$	$P = 2l + 2w = 2(l + w)$
Square	$A = s \times s$	$P = s + s + s + s$
Trapezoid	$A = \frac{1}{2}h(b_1 + b_2)$	
Parallelogram	$A = bh$	

Key

b = base	l = length
h = height	w = width
B = area of base	s = side length
H = height of triangular prism	
s_1, s_2, s_3 are the lengths of each side of the triangular base	
d = diameter	r = radius

Use 3.14 for π.

3 – Dimensional Shape	Volume	Surface Area
Rectangular Prism	$V = lwh = Bh$	$SA = 2lw + 2lh + 2wh = 2B + 2lh + 2wh$
Triangular Prism	$V = \frac{1}{2}lwh = Bh$	$SA = bh + (s_1 + s_2 + s_3)H = 2B + (s_1 + s_2 + s_3)H$
Cone	$V = \frac{1}{3}\pi r^2 h$	
Cylinder	$V = \pi r^2 h$	
Sphere	$V = \frac{4}{3}\pi r^3$	

Percent Change

$$\% \text{ change} = \frac{\textit{difference in amount}}{\textit{original amount}}$$

Pythagorean Theorem

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

Standard Units	Metric Units
Conversions – Length	
1 foot (ft) = 12 inches (in.)	1 centimeter (cm) = 10 millimeters (mm)
1 yard (yd) = 3 feet (ft) = 36 inches (in.)	1 meter (m) = 100 centimeters (cm)
1 mile (mi) = 1,760 yards (yd) = 5,280 feet (ft)	1 meter (m) = 1,000 millimeters (mm)
	1 kilometer (km) = 1,000 meters (m)
Conversions – Volume	
1 cup = 8 fluid ounces (fl oz)	1 liter (l) = 1,000 milliliters (ml)
1 pint (pt) = 2 cups	1 liter (l) = 1,000 cubic centimeters (cu. cm)
1 quart (qt) = 2 pints (pt)	
1 gallon (gal.) = 4 quarts (qt)	
Conversions – Weight/Mass	
1 pound (lb) = 16 ounces (oz)	1 gram (g) = 1,000 milligrams (mg)
1 ton = 2,000 pounds (lb)	1 kilogram (kg) = 1,000 grams (g)

1. **Use the figure below to answer the question.**

600 meters

400 meters

1000 meters
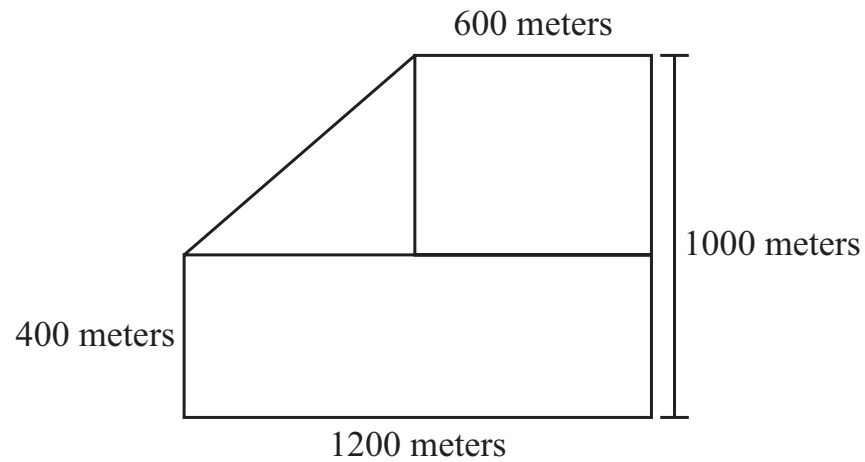
1200 meters

The figure shows three pieces of land available for development. What is the total area of the land available for development?

A. 840,000 meters squared

B. 1,020,000 meters squared

C. 1,080,000 meters squared

D. 1,200,000 meters squared
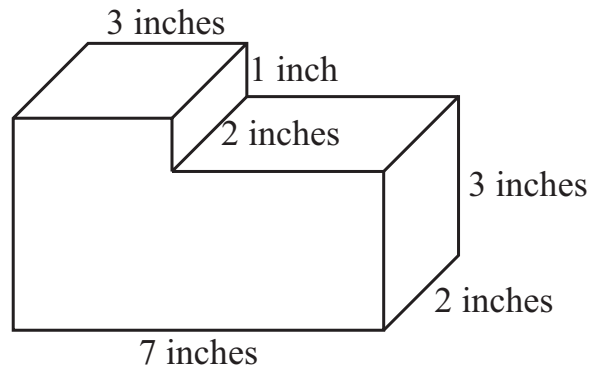
2. The table shows the relationship between x and y.

x	y
24	30
32	40
36	45
48	60
60	75

Which ordered pairs have the same relationship between x and y as the ordered pairs in the table? Select **all** that apply.

A. $(16, 22)$

B. $(44, 55)$

C. $(68, 85)$

D. $(75, 100)$

E. $(160, 200)$

F. $(180, 144)$

3. **Use the diagram of a block below to answer the question.**

3 inches

1 inch

2 inches

3 inches

2 inches

7 inches

What is the surface area of the block?

A. 48 square inches

B. 92 square inches

C. 104 square inches

D. 116 square inches

4. A store sells all of its products at a price 15% greater than the price the store paid for the product. How much does the store sell a product for when the store paid $120 for the product?

A. $102

B. $135

C. $138

D. $180

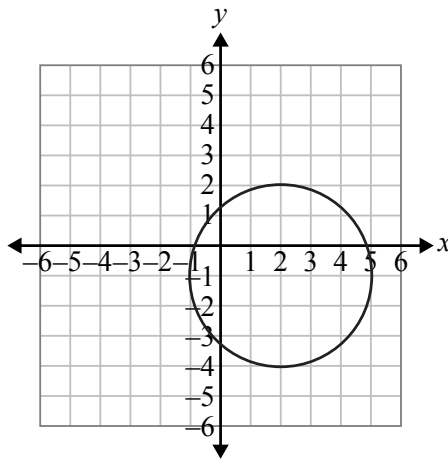5. The graph shows Kara's expenses this month.

Monthly Expenses
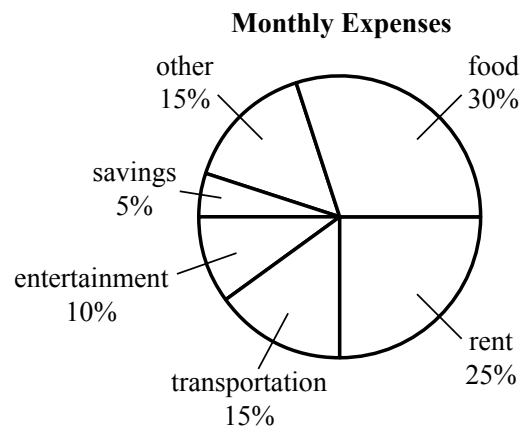
The total of Kara's expenses this month was $3,500. How much more did Kara spend on rent than on transportation?

A. $350

B. $525

C. $875

D. $1,400

         Go on to the next page.

6. **Use the graph to answer the questions.**

Part A

What is the area of the circle?

A. 18.84 square units

B. 19.63 square units

C. 28.26 square units

D. 36.00 square units

Part B

What is the circumference of the circle?

A. 15.70 units

B. 18.84 units

C. 28.26 units

D. 37.68 units

       STOP.

7. Tiffany bought 12 songs for $\$1.09$ per song. Which equation shows the BEST estimate of the total cost?

     A. $10 \bullet \$1 = \$10$

     B. $10 \bullet \$2 = \$20$

     C. $12 \bullet \$1 = \$12$

     D. $12 \bullet \$2 = \$24$

8. As a fundraiser, a student group is selling 2 bags of cookies for $\$3$.

    Which proportion could be used to determine the number of bags of cookies that someone could purchase for $\$18$?

     A. $\dfrac{2}{3} = \dfrac{x}{18}$

     B. $\dfrac{2}{3} = \dfrac{18}{x}$

     C. $\dfrac{x}{2} = \dfrac{3}{18}$

     D. $\dfrac{2}{x} = \dfrac{18}{3}$

Go on to the next page.

9. **Use the table below to answer the question.**

Elizabeth's Number Cube Experiment

Number	Tally	Total
1	||	2
2	|	1
3	||	2
4	||||	4
5	~~||||~~ |	6
6	|||	3

Total   18

The table shows Elizabeth's results from rolling a fair number cube. How does the set of data from Elizabeth's experiment compare to the theoretical probability?

A. The number 1 occurred more than expected.

B. The number 4 occurred more than expected.

C. The number 5 occurred less than expected.

D. The number 6 occurred less than expected.

10. Brad will work for no more than 4 hours painting lamps and vases. It takes him 30 minutes to paint a lamp and 15 minutes to paint a vase.

Part A

Which inequality can be used to describe x, the number of lamps, and y, the number of vases, that Brad can paint?

A. $30x + 15y \geq 4$

B. $30x + 15y \leq 4$

C. $0.5x + 0.25y \geq 4$

D. $0.5x + 0.25y \leq 4$

Part B

If Brad paints 2 lamps in that time, what is the greatest number of vases he can paint?

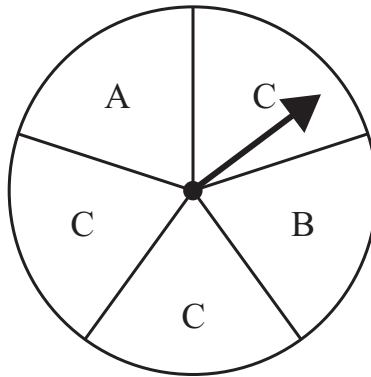A. 1 vase

B. 3 vases

C. 12 vases

D. 16 vases

11. **Use the proportion below to answer the question**.

$$\frac{4}{5} = \frac{25}{x}$$

What is the value of x?

A. $4\frac{1}{5}$

B. 20

C. 26

D. $31\frac{1}{4}$

12. **Use the picture below to answer the question.**

What is the probability of spinning a C?

A. $\dfrac{1}{5}$

B. $\dfrac{1}{3}$

C. $\dfrac{2}{5}$

D. $\dfrac{3}{5}$

13. What is the measure of an angle supplementary to an angle measuring 75°?

A. 15°

B. 25°

C. 105°

D. 115°

Go on to the next page.

14. What is the value of the expression $2g + h$ when $g = 3.5$ and $h = 7$?

    A. 6.2

    B. 10.7

    C. 14

    D. 21

15. Juan spins two different fair spinners. One spinner has numbers 1 through 8. The other has letters A through F. What is the probability that one spinner will land on 3 and the other will land on C?

    A. $\dfrac{1}{48}$

    B. $\dfrac{1}{16}$

    C. $\dfrac{1}{14}$

    D. $\dfrac{1}{7}$

16. Which inequality is equivalent to $p + \dfrac{1}{4} \geq \dfrac{5}{8}$?

    A. $p \leq \dfrac{3}{8}$

    B. $p \geq \dfrac{3}{8}$

    C. $p \leq \dfrac{7}{8}$

    D. $p \geq \dfrac{7}{8}$

Go on to the next page.

17. What is the value of $0.3 + \frac{1}{5}$?

    A. $\frac{1}{8}$

    B. 0.45

    C. 0.5

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

18. What is the value of k when $4 - 2k = -3$?

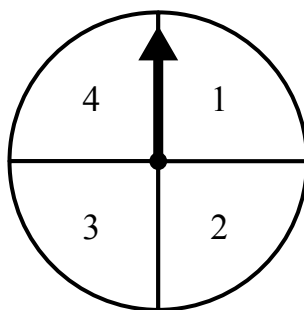   A. $k = -3.5$

    B. $k = -0.5$

    C. $k = 0.5$

    D. $k = 3.5$

19. A spinner is spun 20 times. The results are recorded in the table.

Experimental Results

1	2	3	4
|||	ҬҴᏐ |||	ҬҴᏐ	||||

Which comparisons are correct? Select **all** that apply.

A. The experimental probability of spinning 1 is less than the theoretical probability of spinning 1.

B. The experimental probability of spinning 1 is greater than the theoretical probability of spinning 1.

C. The experimental probability of spinning 2 is equal to the theoretical probability of spinning 2.

D. The experimental probability of spinning 2 is greater than the theoretical probability of spinning 2.

E. The experimental probability of spinning 3 is less than the theoretical probability of spinning 3.

F. The experimental probability of spinning 3 is equal to the theoretical probability of spinning 3.

Go on to the next page.

20. Jim is creating a scale drawing of an airplane. The scale factor is one inch equals seven feet. The length of the actual airplane is 52 feet. What is the length of the airplane in the scale drawing?

A. $\dfrac{7}{52}$ inch

B. $7\dfrac{3}{7}$ inches

C. 45 inches

D. 59 inches

NSCAS Growth Grade 7
Item Type Sampler Answer Key
Mathematics

NSCAS

Sequence	Key	Points
1.	B	1
2.	B, C, E	2
	Two correct and no more than one incorrect or One correct with no incorrect	1
3.	B	1
4.	C	1
5.	A	1
6.	Part A: C Part B: B	2
	Part A or Part B	1
7.	C	1
8.	A	1
9.	B	1
10.	Part A: D Part B: C	2
	Part A or Part B	1
11.	D	1
12.	D	1
13.	C	1
14.	C	1
15.	A	1
16.	B	1
17.	C	1
18.	D	1
19.	A, D, F	2
	Two correct and no more than one incorrect	1
20.	B	1