

# Sample Items

Student Name: \_\_\_\_\_

May 2014  
NC Final Exam  
**Discrete Mathematics**



Public Schools of North Carolina  
State Board of Education  
Department of Public Instruction  
Raleigh, North Carolina 27699-6314

SAMPLE

The 2013–14 school year is the first year of administration for the NC Final Exam of Discrete Mathematics. The releasing of items typically occurs in September following the first administration of an assessment. This process allows the NCDPI to review the item statistics from both the fall and spring administrations and release a set of items that is representative of the assessment. These sample items have not been field tested and are not representative of the full breadth of standards assessed. Please refer to <http://www.ncpublicschools.org/accountability/common-exams/released-forms/> in September for a set of released (field tested) items from the 2013–14 school year. Test specification information is available at: <http://www.ncpublicschools.org/accountability/common-exams/specifications/>.



- 1 The matrix below represents the amounts three recycling centers pay per pound for different materials.

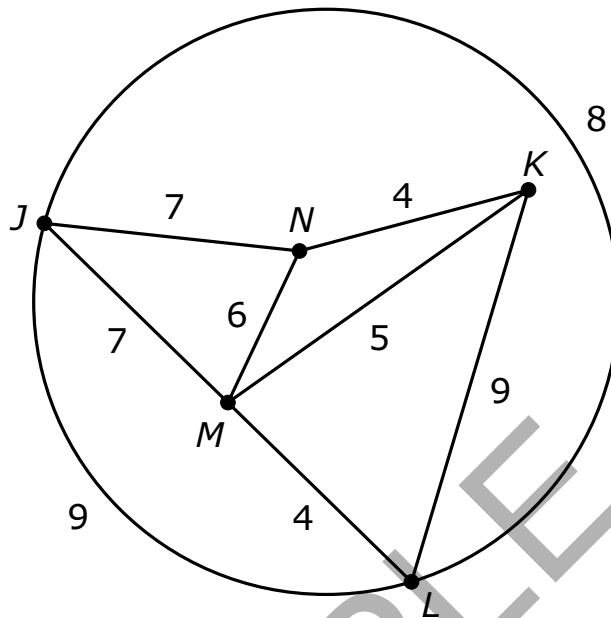
	<b>Center 1</b>	<b>Center 2</b>	<b>Center 3</b>
<b>Aluminum</b>	\$0.40	\$0.42	\$0.42
<b>Copper</b>	\$2.40	\$2.20	\$2.35
<b>Brass</b>	\$1.60	\$1.60	\$1.50

Mike is recycling 24 lb of aluminum, 12 lb of copper, and 34 lb of brass. Which matrix represents the total amount of money that Mike would receive at each center?

- A    [\$28.92   \$163.90   \$108.60]
- B    [\$92.80   \$90.88   \$89.28]
- C    [\$105.60   \$50.64   \$145.18]
- D    [\$29.76   \$83.40   \$159.80]



2 A graph is shown below.



What is the weight of the minimum spanning tree for the graph?

- A 18
- B 20
- C 21
- D 26



- 3 Sarah randomly chose a sample of her math test scores. The scores are listed below.

79, 87, 94, 93, 85

What is the *approximate* standard deviation for this sample of test scores?

- A 3.84  
B 6.15  
C 8.00  
D 15.00
- 4 A baseball team will play the next 8 games at home. The probability of the team winning a home game is 0.65. What is the *approximate* probability of the team winning exactly 5 of the 8 games?

- A 0.12  
B 0.28  
C 0.33  
D 0.41



- 5 A sequence is shown below.

$$36, -6, 1, -\frac{1}{6}, \frac{1}{36}, \dots$$

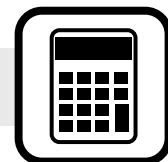
What is the sum of the sequence?

- A  $-\frac{36}{5}$
- B  $\frac{36}{7}$
- C  $\frac{216}{7}$
- D  $\frac{216}{5}$
- 6 Delaware has 3 counties. The table below shows the population of each county in 2010.

County	Population
Kent	162,310
New Castle	538,479
Sussex	197,145

Suppose that the state government wants to put together an advisory committee of 67 members, using the Hill method of apportionment. How many more members should be from New Castle County than from Kent County?

- A 27
- B 28
- C 29
- D 30



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Answer Key**

Item number	Type	Key	Competency Goal(s)
1	MC	B	1 — Matrices and Graphs
2	MC	B	1 — Matrices and Graphs
3	MC	B	2 — Data and Probability
4	MC	B	2 — Data and Probability
5	MC	C	3 — Recursion
6	MC	B	2 — Data and Probability

SAMPLE