Nevada
DEPARTMENT
OF
EDUCATION

GRADE
8

Nevada

Instructional Materials

FOR THE

Criterion Referenced Test

Grade 8

MATHEMATICS

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1 The decimal form of each of four different numbers contains an infinite number of digits. Stacy writes only the first seven digits of each number, without rounding. Which of these numbers is **most** likely to be irrational?

A 4.090909
B 4.125000
C 4.222222
D 4.898979

2 Look at the values shown below.

$$\pi^2 \quad \sqrt{38} \quad \frac{99}{7} \quad 3\sqrt{15}$$

What is the order of the values from **greatest** to **least**?

A $\frac{99}{7}$ $\sqrt{38}$ $3\sqrt{15}$ π^2

B $\frac{99}{7}$ $3\sqrt{15}$ π^2 $\sqrt{38}$

C $3\sqrt{15}$ $\sqrt{38}$ $\frac{99}{7}$ π^2

D $3\sqrt{15}$ $\frac{99}{7}$ π^2 $\sqrt{38}$

3 What is $\sqrt[3]{216}$?

A 6
B 24
C 36
D 72

4 Which is **closest** to the sum of 1.128×10^8 and 7.282×10^7 ?

A 1.86×10^7
B 8.41×10^7
C 1.86×10^8
D 8.41×10^8

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5 Look at the equation below.

$$10y - \frac{3}{2}y + 8 = 7 + 6y - 4\frac{1}{2}$$

What is the solution of the equation?

A $y = 2\frac{7}{9}$

B $y = \frac{21}{29}$

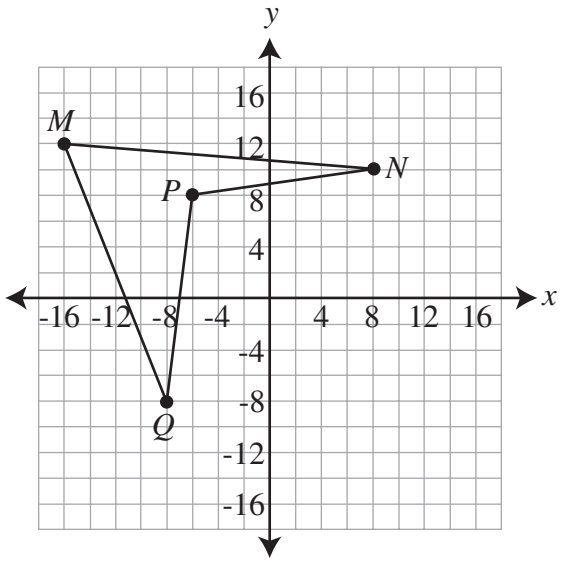
C $y = -1\frac{2}{7}$

D $y = -2\frac{1}{5}$

6 Which equation does **not** describe a linear function?

A $y = 7$
B $y = 2x^2 - 5$
C $2y = 3x - 9$
D $4x - 6y = 13$

7 Polygon *MNPQ* is shown on the coordinate plane below. A dilation with center of dilation at the origin will be performed on the polygon.



The location of vertex *M* after the dilation is (-8, 6) . What is the location of vertex *N* after the dilation?

A (0, 4)
B (1, 2)
C (4, 5)
D (16, 4)

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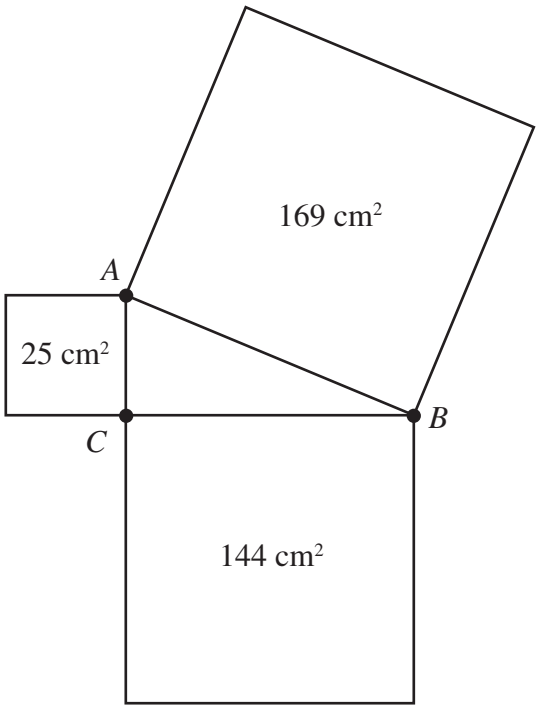
8 Jenny used three squares to make a design. She labeled each square with its area. Jenny drew the squares so that triangle *ABC* was formed, as shown in the diagram below.



Jenny uses the converse of the Pythagorean theorem to write a statement about triangle *ABC* . Which statement could Jenny have written?

A Since triangle *ABC* is a right triangle, the sum of the length of side $\overline{AC}$ and the length of side $\overline{CB}$ is equal to the length of side $\overline{AB}$.

B Since triangle *ABC* is a right triangle, the sum of the area of the square with side $\overline{AC}$ and the area of the square with side $\overline{CB}$ is equal to the area of the square with side $\overline{AB}$.

C Since the sum of the length of side $\overline{AC}$ and the length of side $\overline{CB}$ is equal to the length of side $\overline{AB}$, the longest side of triangle *ABC*, then triangle *ABC* is a right triangle.

D Since the sum of the area of the square with side $\overline{AC}$ and the area of the square with side $\overline{CB}$ is equal to the area of the square with side $\overline{AB}$, the longest side of triangle *ABC*, then triangle *ABC* is a right triangle.

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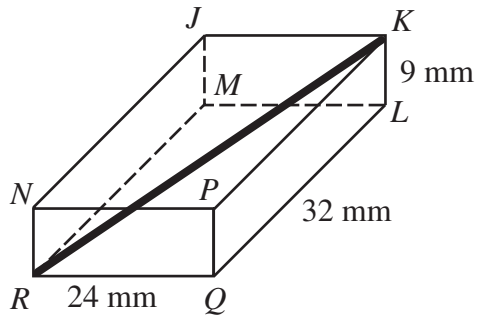
9 A rectangular prism is shown in the diagram below.



What is the length of the line segment that extends between vertex *K* and vertex *R* ?

A $\sqrt{65}$ mm

B 40 mm

C 41 mm

D $\sqrt{6912}$ mm

10 The locations of point *A* and point *B* on a coordinate plane are described by the ordered pairs listed below.

***A*(-3, 5)** ***B*(2, -1)**

What is the shortest distance between point *A* and point *B* ?

A $\sqrt{11}$ units

B $\sqrt{37}$ units

C $\sqrt{61}$ units

D $\sqrt{73}$ units

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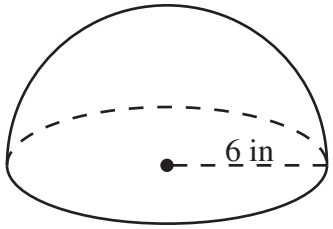
Write your answer to Question 11 on a separate sheet of paper. Be sure to answer Parts A and B.

11 A bake shop makes a cake shaped like a hemisphere, as pictured below.



cake

A What is the volume, in cubic inches, of the cake? Leave your answer written in terms of π. Show your work.

B The bake shop also makes a cake shaped like a cylinder. This cake has the same volume and radius as the cake from **Part A**. What is the height, in inches, of the cake shaped like a cylinder? Show your work or explain your thinking

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Correct Answers for Multiple-Choice Items

Item Level Data

Item Number	Strand	DOK	P-value
1	1	1	0.29
2*	1	2	0.23
3*	1	1	0.23
4	1	1	0.25
5*	2	1	0.32
6	2	1	0.21
7*	4	2	0.22
8	4	2	0.23
9*	4	2	0.26
10	4	2	0.22

P-value is the proportion of students who got the item correct

*This is an item that was developed for these Instructional Materials, and it mirrors content assessed from an item field tested in the 2011-2012 test administration. The p-value and percentages reported here are based on the p-value and percentages of the item from the 2011-2012 field test.

Percentage of Students Selecting a Given Response

A	B	C	D
18%	18%	35%	29% ✓
27%	23% ✓	17%	33%
23% ✓	31%	15%	31%
10%	24%	25% ✓	41%
21%	24%	23%	32% ✓
47%	21% ✓	13%	20%
13%	20%	22% ✓	45%
23%	32%	22%	23% ✓
21%	33%	26% ✓	20%
46%	26%	22% ✓	6%

✓ = Correct Answer

Detailed objectives for Content Standards and Depth of Knowledge (DOK) descriptions can be found on the Nevada Department of Education web site.

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Version 6 #50 **I-Ref #:** **WE: Y12_MA2918** **Rpt Cat(s): NO NV MATCH**
Date: 1/24/12 **CCCS: 8.G.9**

Correct Answers

Part A: 144π (cubic inches)

$$V = \frac{1}{2}\left(\frac{4}{3}\pi r^3\right)$$
$$V = \frac{2}{3}\pi\left(6^3\right)$$
$$V = \frac{2}{3}\pi\left(216\right)$$
$$V = 144\pi$$

or equivalent work

Part B: 4 (inches)

$$V = \pi r^2 h$$
$$144\pi = \pi\left(6\right)^2 h$$
$$144 = 36h$$
$$4 = h$$

or equivalent work

OR

Set the two volumes equal to each other and then solve for the height. The height of the cake is 4 inches since $144 \div 36 = 4$.

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