



NEVADA INSTRUCTIONAL MATERIALS

FOR THE
NEVADA ACADEMIC CONTENT STANDARDS FOR MATHEMATICS

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Grade 6

TEACHER EDITION



Scoring Support Materials

Grade 6 Mathematics

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Introduction

This document represents the Phase III release of Nevada Instructional Materials. These released materials were developed in collaboration with Nevada educators, the Nevada Department of Education, and WestEd (a nonprofit research development and service agency).

These materials are intended for use in various guided instructional activities to support deep understanding of the Nevada Academic Content Standards (NVACS) for English Language Arts and mathematics based on Common Core. The Nevada Instructional Materials provide educators opportunities to investigate and explore the standards and tasks that are aligned to the standards. The Nevada educators involved in the development of these materials also developed “Teacher Tips” to assist in using these materials as an instructional resource. The Nevada Instructional Materials also provide educators opportunities to investigate and explore the standards and tasks that are aligned to the standards.

While these materials can provide students with practice in responding to a variety of assessment items, it is more important that they are used to help students deepen their understanding of the expectations embedded in the standards. If these instructional materials are used solely as an assessment practice activity, we highly recommend that educators go over each item with their students and evaluate each answer choice so that students can better understand the knowledge required to successfully complete each task.

Through rich classroom discussion around each item and the various answer choices or potential responses, educators can actively engage students in critical thinking, reasoning, and application of knowledge and skills, helping to ensure all students are ready for success in the 21st century.



Item Level Data

Item Number	NVACS*	DOK	Answers
1	6.RP.A1	1	-----
2	6.RP.A2	1	B
3	6.RP.A3a	2	-----
4	6.RP.A3c	2	-----
5	6.RP.A3d	2	C
6	6.RP.A3b	2	-----
7	6.RP.A3d	3	-----
8	6.NS.A1	2	-----
9	6.NS.A1	2	-----
10	6.NS.A1	3	-----
11	6.NS.B2	1	-----
12	6.NS.B3	1	-----
13	6.NS.B4	2	A
14	6.NS.B4	1	A, D
15	6.NS.C5	1	-----
16	6.NS.C6b	1	B
17	6.NS.C6c	1	-----
18	6.NS.C7b	1	B
19	6.NS.C7d	1	E, F
20	6.NS.C8	2	-----
21	6.NS.C8	2	-----
22	6.EE.A1	1	B, C, E
23	6.EE.A2a	1	D

Item Number	NVACS*	DOK	Answers
24	6.EE.A2c	1	-----
25	6.EE.A3	1	-----
26	6.EE.B5	2	E, F, G
27	6.EE.B6	2	D
28	6.EE.B7	2	-----
29	6.EE.B8	3	-----
30	6.EE.C9	3	-----
31	6.G.A1	2	A, B, E
32	6.G.A2	2	-----
33	6.G.A1	3	-----
34	6.G.A3	2	-----
35	6.G.A3	2	-----
36	6.G.A4	2	B
37	6.G.A4	2	-----
38	6.SP.A1	1	B, D, E
39	6.SP.A2	1	D
40	6.SP.A3	2	-----
41	6.SP.B4	2	-----
42	6.SP.B4	3	-----
43	6.SP.B5c	2	-----
44	6.SP.B5d	2	B
45	6.SP.B5d	2	-----

*Nevada Academic Content Standards

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



**Scoring Guides
and
Student Response
Examples by
Score Point**

**Grade 6
Mathematics**

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.RP.A1

1

All the jelly beans in a jar are described in the list below.

- 25 red jelly beans
- 34 yellow jelly beans
- 30 green jelly beans
- 36 orange jelly beans

Select true or false for **each** statement about the jelly beans in the jar.

A For every 1 red jelly bean in the jar, there are 5 jelly beans of other colors.

True False

B For every 17 yellow jelly beans in the jar, there are 18 orange jelly beans.

True False

C The ratio of green jelly beans in the jar to orange jelly beans in the jar is $\frac{5}{6}$.

True False

D The ratio of orange jelly beans in the jar to the total number of jelly beans in the jar is $\frac{36}{89}$.

True False

Scoring Notes:

True: B, C

False: A, D

Rationale A: based on 25/total of 125

Rationale D: based on orange/(red + yellow + green)

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.RP.A2

2

To drive 256 miles, a car uses 8 gallons of gas. The car uses gas at an average rate of

- A 24 miles per gallon.
- B 32 miles per gallon.
- C 37 miles per gallon.
- D 40 miles per gallon.

Scoring Notes:

Rationale A: multiple of 8

Rationale B: correct

Rationale C: splits 256 into 25 and 56, divides each by 8 to get 3 and 7

Rationale D: multiple of 8

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.RP.A3a

3

The ratio of the number of potatoes used to the number of carrots used is the same in each number of pots of stew that Mrs. Lee makes. The table below shows this ratio when 4 pots of stew are made.

Mrs. Lee's Stew

Number of Pots of Stew	Number of Potatoes	Number of Carrots
1		
2		
3		
4	12	16
5		
6		

Based on the ratio shown in the table, complete the table to include the number of potatoes and the number of carrots in each number of pots of stew that Mrs. Lee makes.

Scoring Notes:

Mrs. Lee's Stew

Number of Pots of Stew	Number of Potatoes	Number of Carrots
1	3	4
2	6	8
3	9	12
4	12	16
5	15	20
6	18	24

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.RP.A3c

- 4** A minor league baseball team won 75% of the games the team played during a season. The team won 108 games. What is the total number of games the team played during the season? Write the answer in the blank below.

_____ games

Scoring Notes:

144 (games)

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.RP.A3d

- 5** Jerry is cutting pieces of ribbon for an art project.

- Each piece of ribbon must be exactly 7 inches long.
- He has 2 spools of ribbon.
- Each spool holds 20 yards of ribbon.

What is the **greatest** number of 7-inch pieces Jerry can cut from the 2 spools of ribbon?

- A 68 pieces
- B 102 pieces
- C 204 pieces
- D 206 pieces

Scoring Notes:

Rationale A: incorrectly converts yards to inches by multiplying 20 by 12, getting 34 7-inch pieces per roll

Rationale B: converts correctly to 720 inches, but only uses 1 spool

Rationale C: correct

Rationale D: converts correctly to 720 inches, divides by 7 and gets 102.85, rounds up to 103, then doubles for 2 spools

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.RP.A3b

- 6** Alfonzo contributes \$0.06 of every dollar he earns to his retirement plan. Alfonzo earned \$1,640.00 last week. What dollar amount did he contribute to his retirement plan last week? Show your work.

Write your response on the grid below.

Scoring Notes:

For this item, a full-credit response (2 points) includes

- correct dollar amount, (\$)98.40

AND

- correct work

For example,

- $1,640.00 \cdot 0.06 = 98.40$

For this item, a partial-credit response (1 point) includes either

- correct dollar amount, (\$)98.40

OR

- incorrect answer based on a calculation error (work must be shown)

For this item, a no-credit response (0 points) includes none of the features of a full- or partial-credit response.

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.RP.A3d

7 Darlene is running a race for charity. During the entire race, she maintains an average running rate of 3.2 **kilometers** per 20 **minutes**.

- A** Darlene finishes the race in 3,750 **seconds**. What is the total number of **meters** Darlene runs during the race? Show your work or explain your thinking.
- B** The list below shows the amounts of money Darlene could earn for the charity, based on the amount of time it takes her to finish the race.
- \$400.00 for finishing in less than 1 hour
 - \$300.00 for finishing from 1 hour to 1.5 hours
 - \$200.00 for finishing in more than 1.5 hours

Explain why Darlene earns an average of \$4.80 for the charity each minute she runs during the race. Show your work.

Write your response on the grid on the next page.

Correct Answers

Part A: 10000 (meters)

$$3.2 \text{ km} = 3200 \text{ m}$$

$$3200 \div 20 = 160$$

$$3750 \div 60 = 62.5$$

$$160 \cdot 62.5 = 10000$$

or equivalent work

OR

Sample Explanation:

Multiply the 3.2 kilometers by 1000 to find the number of meters: 3.2 kilometers equals 3200 meters. Then divide the number of meters by 20 minutes to find how many meters Darlene runs in one minute: 3200 meters divided by 20 minutes equals 160 meters per minute. To find how long she runs in minutes, divide the total number of seconds she runs by 60 since there are 60 seconds in one minute. She runs for 62.5 minutes, since $3750 \div 60 = 62.5$. Multiply the number of meters Darlene runs per minute, 160, by how many minutes she runs, 62.5. Since $160 \cdot 62.5 = 10000$, Darlene runs a total of 10000 meters.

Part B: Accept all correct and complete explanations.

Sample Explanation:

She finishes in 62.5 minutes, which is equivalent to 1 hour 2.5 minutes. Because this is between 1 and 1.5 hours, she earns \$300 for the charity. Divide \$300.00 by 62.5 minutes, $300.00 \div 62.5 = 4.80$, to get an average of \$4.80 per minute she ran.

Instructional Materials Question 7

A Well I first did 3750 divided by 60 to find the number of minutes she can for. Secondly I turned 3.2 kilometers into 3200 meters. Then I divided the 3200 meters by 20 to find how far she can in a minute. So after I found this out I times the time she ran by how far she can for and got 10,000 meters.

$$\begin{array}{r}
 62.5 \\
 60 \overline{) 3750.0} \\
 \underline{360} \\
 0150 \\
 \underline{120} \\
 0300 \\
 \underline{300} \\
 000
 \end{array}
 \qquad
 \begin{array}{r}
 160 \\
 20 \overline{) 3200} \\
 \underline{20} \\
 120 \\
 \underline{120} \\
 000
 \end{array}
 \qquad
 \begin{array}{r}
 62.5 \\
 \cancel{180} \\
 10000
 \end{array}$$

10,000 meters

B She earns an average of \$4.80 because she can for 62.5 minutes. When you either divid the amount of money she gets over all from the time she can by the average she gets in a minute you get the same time she ran. or if you multiple the time she ran by the average amount she get per minute you get her over all total amount of money. which shows that her average would be \$4.80.

$$\begin{array}{r}
 62.5 \\
 4.8 \overline{) 3180.00} \\
 \underline{2880} \\
 0300 \\
 \underline{240} \\
 0600 \\
 \underline{600} \\
 000
 \end{array}
 \qquad
 \begin{array}{r}
 62.5 \\
 \cancel{4.8} \\
 300000
 \end{array}$$

Score Point: 3
 The response to Part A includes the correct answer with correct work (1.5). The response to Part B includes a correct and complete explanation with correct work (1.5).

Instructional Materials Question 7

A

$$\begin{array}{r} 0.16 \\ 20 \overline{) 3.20} \\ \underline{0} \\ 32 \\ \underline{20} \\ 120 \\ \underline{120} \\ 0 \end{array}$$

$.16 \text{ km/min}$

62.5 min

she ran 10000 meters

$$\begin{array}{r} 0.625 \\ 60 \overline{) 37500} \\ \underline{0} \\ 375 \\ \underline{360} \\ 150 \\ \underline{120} \\ 300 \\ \underline{300} \\ 0 \end{array}$$

$$\begin{array}{r} 16 \\ \times 625 \\ \hline 800 \\ 3200 \\ 9600 \\ \hline 10000 \end{array}$$

10,000 km = 10,000 m

B

she earns an average of \$4.80 for charity each minute because she runs 62.5 minutes which is less than 1.5 hours but more than 1 hour.

Score Point: 2

The response to Part A includes the correct answer with correct work (1.5). The response to Part B includes a correct and complete explanation with no work (1.0).

Instructional Materials Question 7

A. Darlene ran a total of 1008 m. because it took her 1 hour 2 min. and 30 sec to finish. I divided the seconds by 60 to change them to minutes to get that number. Next I changed the hours into 20 minutes sections. That can out to 3.15 20 minutes. I multiplied 3.15 to 32 to convert it to kilometer. That comes out to 10.08. Finally I converted that to meters by moving the decimal 2 times to the right. That was 1008 m. My answer.

$$\begin{array}{r}
 3.15 \\
 \times 32 \\
 \hline
 630 \\
 9450 \\
 \hline
 10080
 \end{array}$$

$$\begin{array}{r}
 62.5 \\
 \hline
 603750 \\
 360 \\
 \hline
 0150 \\
 120 \\
 0300
 \end{array}$$

B Darlene finished between 1 and 1.5 hours so she gets 300\$ for charity.

Since she gets 4.80\$ per min. that comes out to exactly 300\$ if you had 1 hour 2 min. 30 sec.

I multiplied 4.8 x 60 and got 288 then added 9.6 (2 min of \$) and got 297.6 then added 2.4 (30 sec of \$) and got exactly 300\$.

300 dollars

\$ 4.80 per minute

my work

$$\begin{array}{r}
 4.8 \\
 \times 60 \\
 \hline
 2880 \\
 480 \\
 \hline
 2976 \\
 + 2.4 \\
 \hline
 3000
 \end{array}$$

Score Point: 2

The response to Part A includes some correct procedure (0.5). The response to Part B includes a correct and complete explanation with correct work (1.5).

Instructional Materials Question 7

A

$ \begin{array}{r} 62.5 \\ 60 \overline{) 3750.0} \\ \underline{360} \\ 150 \\ \underline{120} \\ 300 \end{array} $	$ \begin{array}{r} 60 \\ \underline{240} \end{array} $	$ \begin{array}{r} 60 \\ \underline{360} \end{array} $	$ \begin{array}{r} 60 \\ \underline{120} \end{array} $	$ \begin{array}{r} 60 \\ \underline{5} \\ 300 \end{array} $
--	---	---	---	---

62.5 \approx 1.5

B

$ \begin{array}{r} 62.5 \\ \underline{4.80} \\ 000 \\ 50000 \\ 5000000 \\ \underline{25000000} \\ 300000 \end{array} $	300000
--	--

Score Point: 1

The response to Part A includes some correct procedure (0.5). The response to Part B includes some correct procedure (0.5).

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.NS.A1

8

Laura has $7\frac{2}{3}$ yards of wire to use for making necklaces. Each necklace uses $\frac{2}{3}$ yard of wire. What is the **greatest** number of necklaces Laura can make? Write the answer in the blank below.

_____ necklaces

Scoring Notes:

11 (necklaces)

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.NS.A1

9

José is helping some children paint shelves. He has $\frac{3}{4}$ gallon of paint. He will give each child $\frac{1}{8}$ gallon of paint to use on the shelves. What is the greatest number of children that José can give paint to?

Use the rectangle shown below to make a visual model to explain your answer. More lines can be drawn on the rectangle, and the rectangle can be shaded.



Write your response on the grid below.

Scoring Notes:

For this item, a full-credit response (2 points) includes

- correct number of children, 6 (children)
AND
- correct visual model
AND
- explanation indicating how the visual model was shaded

For example,

•



AND

- The rectangle represents 1 gallon. Since the rectangle is divided into 4 equal parts, shade 3 of the parts to represent $\frac{3}{4}$ gallon. Draw a line across the rectangle to divide it into 8 equal parts. Since 6 of the 8 parts in the region are shaded, there are six $\frac{1}{8}$ gallon in $\frac{3}{4}$ gallon. So José can give 6 children $\frac{1}{8}$ gallon of paint each.

For this item, a partial-credit response (1 point) includes either

- correct number of children, 6 (children)
OR
- correct visual model
OR
- some explanation indicating how the visual model was shaded

For this item, a no-credit response (0 points) includes none of the features of a full- or partial-credit response.

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.NS.A1

10

Andy, LaTasha, and Shannon go to a farm to pick cherries. Together, they pick $8\frac{1}{2}$ pounds of cherries. They will fill bags with all the cherries they pick until each bag weighs $\frac{3}{4}$ pound.

- A** Each of the 3 friends eats an equal amount of the number of **pounds** of cherries remaining after filling the greatest possible number of bags. How many pounds of cherries does each friend eat? Show your work or explain your thinking.
- B** The weight of each cherry is about $\frac{1}{64}$ pound. Explain why the 3 friends **most** likely ate different numbers of cherries. As part of your explanation, list a number of cherries that each friend could have eaten.

Write your response on the grid on the next page.

Scoring Notes:

Score	Description
3	Student scores 3 points.
2	Student scores 2–2.5 points.
1	Student scores 0.5–1.5 points.
0	Student’s response provides insufficient evidence of appropriate skills or knowledge to successfully accomplish the task.
Blank	No student response.

Score Points

Part A:	score 1.5 points	correct answer with correct work or complete explanation
	OR	
	score 1.0 point	correct answer with partially correct work or incomplete explanation
	OR	incorrect answer due to a calculation error (work must be shown)
OR		
	score 0.5 point	correct answer with no work or explanation
	OR	partially correct or incomplete explanation
	OR	some correct procedure
Part B:	score 1.5 points	correct and complete explanation (based on answer from Part A)
	OR	
	score 1.0 point	partially correct or incomplete explanation (based on answer from Part A)
OR		
	score 0.5 point	vague explanation only

Correct Answers

Part A: $\frac{1}{12}$ (pound)

$$8\frac{1}{2} \div \frac{3}{4} = \frac{17}{2} \cdot \frac{4}{3} = \frac{68}{6} = 11\frac{1}{3}$$

$$\frac{3}{4} \cdot \frac{1}{3} = \frac{3}{12} = \frac{1}{4}$$

$$\frac{1}{4} \div 3 = \frac{1}{4} \cdot \frac{1}{3} = \frac{1}{12}$$

or equivalent work

OR

Sample Explanation:

Divide the total number of pounds of cherries picked, $8\frac{1}{2}$, by the number of pounds each bag weighs, $\frac{3}{4}$, to find how many bags are completely filled and how many pounds of cherries are left after filling the bags. So 11 bags can be completely filled and $\frac{1}{3}$ of another bag can be filled. Because $\frac{3}{4} \cdot \frac{1}{3} = \frac{3}{12} = \frac{1}{4}$, there is $\frac{1}{4}$ pound remaining, and $\frac{1}{4} \div 3 = \frac{1}{4} \cdot \frac{1}{3} = \frac{1}{12}$. Each friend ate $\frac{1}{12}$ pound of cherries.

Part B: Accept all correct and complete explanations.

Sample Explanation:

They most likely each ate a different number of cherries because $\frac{1}{12} \div \frac{1}{64} = \frac{1}{12} \cdot 64 = 5\frac{4}{12} = 5\frac{1}{3}$. Since $5\frac{1}{3} \cdot 3 = 16$, they probably divided the 16 cherries as close to evenly as possible, with two friends each getting 5 cherries and one friend getting 6 cherries.

No 3-point responses

Instructional Materials Question 10

A First, I have to find out how many bags there are that are completely filled.

$\frac{82}{4}$ total pounds picked with $\frac{3}{4}$ per bag
 $\frac{82}{4} = \frac{34}{1}$ and $\frac{3}{4} \times 4 = \frac{33}{1}$

There are eleven total bags with $\frac{1}{4}$ pound remaining.

Now we have to divide $\frac{1}{4}$ among three friends.

$$\frac{1}{4} \div \frac{3}{1} \quad \left(\frac{1}{4} \times \frac{1}{3} = \frac{1}{12} \right)$$

Each friend gets $\frac{1}{12}$ of a pound of cherries.

B If each cherry weighs $\frac{1}{64}$ of a pound then 64 cherries equals 1 pound. $64 \times 8\frac{1}{2}$ (I multiplied it by eight and $\frac{1}{2}$ "because that is the total number of cherries picked) = 544.

If there are three friends who want an equal amount of cherries, they can't have it because three does not divide into 544 evenly. That is why they would have to eat different numbers of cherries.

If the friends wanted to get to the most equal amounts of cherries, then..

1st friend = 181 cherries

2nd friend = 181 cherries

3rd friend = 182 cherries

That way only one friend gets a larger amount than the others

Score Point: 2

The response to Part A includes the correct answer with complete explanation (1.5). The response to Part B includes a partially correct explanation (1.0).

Instructional Materials Question 10

A

$$\frac{1}{2} \cdot \frac{3}{4} = \frac{3}{8}$$

$$\frac{11}{2} \div \frac{3}{4} = \frac{11}{2} \cdot \frac{4}{3} = \frac{22}{3} = 7\frac{1}{3}$$

$$\frac{1}{4} \cdot \frac{1}{3} = \frac{1}{12}$$

They filled 7 bags with cherries and had $\frac{1}{3}$ of a bag left. That means they have $\frac{1}{4}$ a pound left but you would divide that by 3, because there are three friends, and you get $\frac{1}{12}$ pounds each.

B

The three friends ate different amounts of cherries because every cherry doesn't weigh the same amount. 5 and $\frac{1}{3}$ cherries

$$\frac{1}{12} \div \frac{1}{64} = \frac{1}{12} \cdot \frac{64}{1} = \frac{16}{3}$$

Score Point: 2

The response to Part A includes the correct answer with partially correct work (1.0). The response to Part B includes an incomplete explanation (1.0).

Instructional Materials Question 10

A

$$\frac{1}{2} \div \frac{3}{4} = \frac{1}{2} \cdot \frac{4}{3} = \frac{4}{6} = \frac{2}{3}$$

$$\frac{2}{3} \cdot 18 = 12$$

$$\frac{1}{2} \cdot \frac{2}{4} = \frac{1}{4} \text{ lbs}$$

$$\frac{1}{4} \div \frac{3}{4} = \frac{1}{4} \times \frac{4}{3} = \frac{1}{3} \text{ lbs}$$

B

Score Point: 1

The response to Part A includes the correct answer with complete work (1.5). The response to Part B is missing (0).

Instructional Materials Question 10

A $8\frac{1}{4}$ pounds is the maximum amount of pounds that could be put in 11 bags the maximum amount with $\frac{1}{4}$ pounds left divided by the three friends and you get $\frac{1}{12}$ for each of them.

B because $\frac{1}{12}$ can not can not go into

Score Point: 1

The response to Part A includes the correct answer with incomplete work (1.0). The response to Part B is incorrect (0).

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.NS.B2

11 What is $44,250 \div 17$?

quotient: _____

remainder: _____

Scoring Notes:

quotient: 2,602

remainder: 16

(Note: Remainder may be 0 if quotient is expressed as a mixed number.)

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.NS.B3

12 Indicate whether **each** equation below is true or false.

A $10.2 + 5.62 = 15.82$ True False

B $17.62 - 12.89 = 5.27$ True False

C $44.44 \div 0.22 = 2.2$ True False

D $6.21 \times 70.5 = 437.805$ True False

Scoring Notes:

True: A, D

False: B, C

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.NS.B4

13

There are 20 tokens and 12 cards in a game box. Each person who plays the game receives an equal number of tokens and an equal number of cards. What is the **greatest** number of people who can play the game at the same time, using all the tokens and cards in the box?

- A 4 people
- B 5 people
- C 6 people
- D 8 people

Scoring Notes:

Rationale A: correct

Rationale B: factor of 20 but not 12

Rationale C: factor of 12 but not 20

Rationale D: difference between 20 and 12; greatest number listed

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.NS.B4

14

Which pairs of numbers have 9 as their greatest common factor (GCF)? Select **all** that apply.

- A** 18 and 45
- B** 27 and 54
- C** 36 and 90
- D** 45 and 72
- E** 54 and 81

Scoring Notes:

Correct answers: A, D

Rationale B: GCF is 27, does not think a number in the pair can also be a factor

Rationale C: GCF is 18, does not remember 90 is divisible by 18

Rationale E: GCF is 27, only thinks of 54 as $6 \cdot 9$ and 81 as $9 \cdot 9$, does not consider other factors

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.NS.C5

15 The top of a diving board is 5 feet above the surface of the water in a pool. The depth of the water in the entire pool is 15 feet. The number 5 can be used to describe the location of the diving board relative to the surface of the water.

A statement and two tables are shown below. Circle a number from each table to complete the statement and make it true.

The surface of the water in the pool can be described by the number , and the bottom of the pool can be described by the number .

Option 1
-5
0
10
15

Option 2
-20
-15
0
15

Scoring Notes:

Correct answers:

Option 1: 0
 Option 2: -15

Rationales:

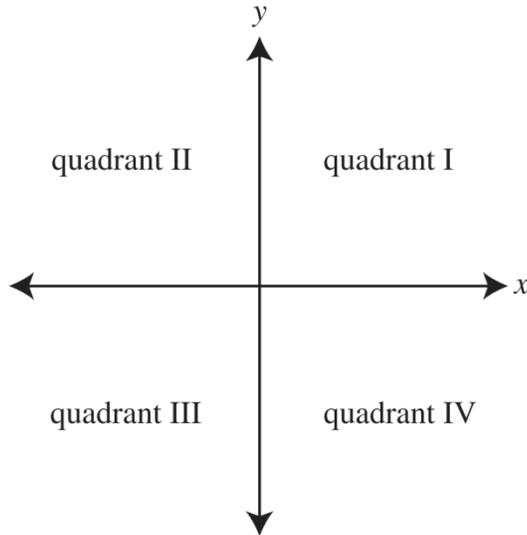
Option 1:
 -5: water is 5 feet below the diving board
 10: $15 - 5$
 15: surface of water is 15 feet above bottom of pool

Option 2:
 -20: bottom of pool is 20 feet below diving board
 0: thinks bottom of pool should be at 0 since it is “lowest”
 15: depth of water only, does not consider location relative to diving board

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.NS.C6b

16

The quadrants of a coordinate plane are shown in the diagram below.



In which quadrant is the point $(-6, 8)$ located?

- A quadrant I
- B quadrant II**
- C quadrant III
- D quadrant IV

Scoring Notes:

Rationale A: $(6, 8)$

Rationale B: correct

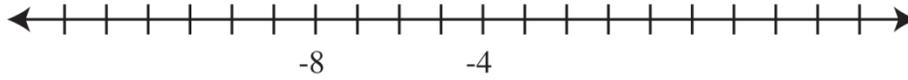
Rationale C: $(-6, -8)$

Rationale D: $(6, -8)$

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.NS.C6c

17

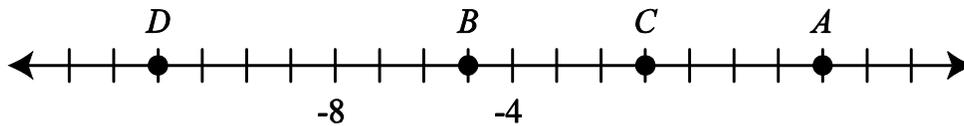
A number line is shown below.



Graph the points listed below on the number line and label each point with the correct letter.

- Point *A* is located at 3 .
- Point *B* is located at -5 .
- Point *C* is located at -1 .
- Point *D* is located at -12 .

Scoring Notes:



Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.NS.C7b

18

A bank account balance can be represented by a positive number or a negative number. Which comparison of two bank account balances is true?

- A $-\$150 > \155
- B $-\$150 > -\155
- C $-\$150 > \145
- D $-\$150 > -\145

Scoring Notes:

Rationale A: thinks both values are negative

Rationale B: correct

Rationale C: compares absolute values

Rationale D: compares absolute values

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.NS.C7d

19

George has a debt greater than \$40 . Which of these could be George's debt? Select **all** that apply.

- A** \$55
- B** \$49
- C** \$28
- D** -\$15
- E** -\$41
- F** -\$63

Scoring Notes:

Correct answers: E, F

Rationale A: selects a positive number greater than 40

Rationale B: selects a positive number greater than 40

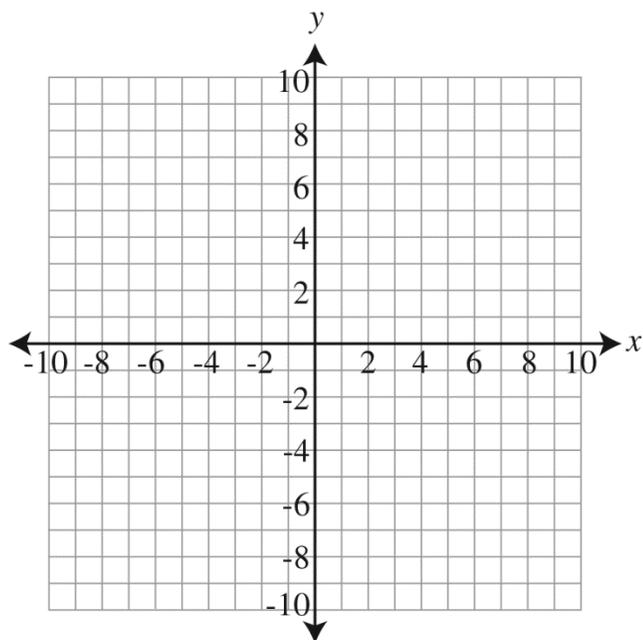
Rationale C: selects a positive number less than 40

Rationale D: selects a negative number, but greater than -40

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.NS.C8

20

Andre uses the coordinate plane below to plan his vegetable garden.



Andre will put a tomato plant at $(-2, 6)$. He will put a bean plant at least 2 units away from the tomato plant, along a grid line.

On the coordinate plane, graph all the ordered pairs that represent the **closest** locations at which Andre could put the bean plant.

Scoring Notes:

4 points, graphed at $(-2, 8)$, $(-2, 4)$, $(-4, 6)$, and $(0, 6)$

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.NS.C8

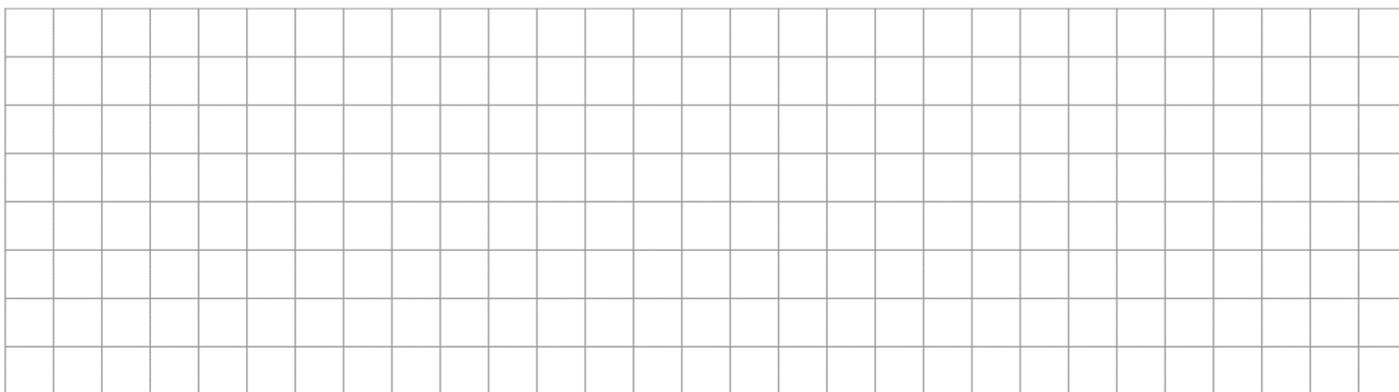
21

Point P , point Q , and point R are graphed on a coordinate plane. Some information about the points is listed below.

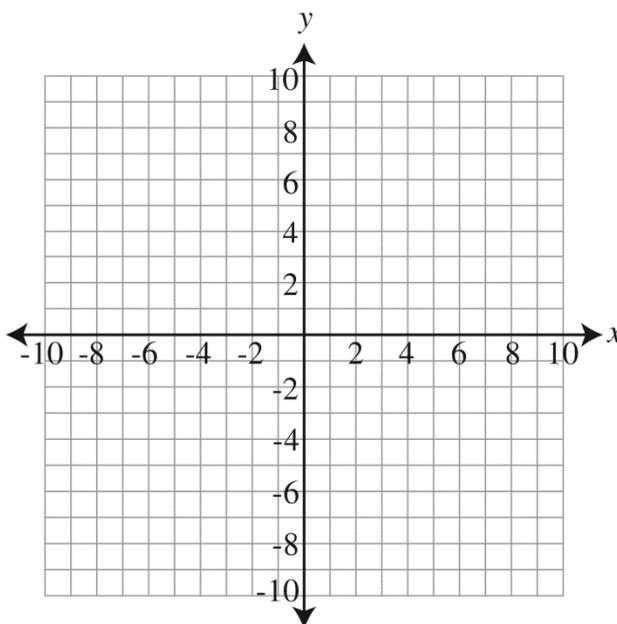
- Point P is located at $(4, 3)$.
- Point Q is located at $(-5, -2)$.
- Point R has the same x -coordinate as point P .
- The absolute value expression $|-5| + |4|$ describes the distance along a grid line, in units, from point Q to point R .

What is the location of point R ? Explain your thinking.

Write your response on the grid below.



Graph point P , point Q , and point R on the coordinate plane below and label each point.



Scoring Notes:

For this item, a full-credit response (2 points) includes

- correct location of point R on the coordinate plane, $(4, -2)$
AND
- explanation indicating how point R was determined
AND
- point P , point Q , and point R graphed and labeled correctly on the coordinate plane

For example,

- Point R is located at $(4, -2)$, because it has the same x -coordinate as point P : 4 . The value of the absolute value expression is 9, so point R is 9 units away from point Q along a grid line. The only point 9 units away from point Q with an x -coordinate of 4 would have the same y -value as point Q : -2 .
AND
- Coordinate plane with the following points graphed and labeled:
point P $(4, 3)$
point Q $(-5, -2)$
point R $(4, -2)$

For this item, a partial-credit response (1 point) includes either

- correct location of point R on the coordinate plane, $(4, -2)$
OR
- some explanation indicating how point R was determined
OR
- point P , point Q , and point R graphed and labeled correctly on the coordinate plane

For this item, a no-credit response (0 points) includes none of the features of a full- or partial-credit response.

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.EE.A1

22 Which expressions have a value that is **less** than 30 ? Select **all** that apply.

A $2^3 + [5(4-3)]^2$

B $[(2^3 + 5) + (4-3)^2]$

C $2^3 + 5(4-3)^2$

D $[2^3 + 5(4-3)]^2$

E $2^3 + (5 \cdot 4) - 3^2$

Scoring Notes:

Correct answers: B, C, E

Rationale A: computes as $2^3 + 5[(4-3)^2]$

Rationale D: computes as $(2^3 + 5)(4-3)^2$

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.EE.A2a

23 Which expression describes subtracting $\frac{1}{4}$ from the product of $\frac{3}{8}$ and a number (x)?

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

B $\frac{1}{4} - \frac{3}{8}x$

C $\frac{1}{4}x - \frac{3}{8}$

D $\frac{3}{8}x - \frac{1}{4}$

Scoring Notes:

Rationale A: subtracts $\frac{1}{4}$ from $\frac{3}{8}$, then multiplies

Rationale B: reverses order

Rationale C: product with wrong factor

Rationale D: correct

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.EE.A2c

- 24** The expression below can be used to determine the temperature in degrees Celsius for any temperature (f) in degrees Fahrenheit ($^{\circ}\text{F}$).

$$\frac{5}{9}(f - 32)$$

What is the temperature in degrees Celsius when the temperature is 95°F ? Show your work.

Write your response on the grid below.

Scoring Notes:

For this item, a full-credit response (2 points) includes

- correct temperature in degrees Celsius, 35 (degrees Celsius)
- AND**
- correct work

For example,

- $\frac{5}{9}(95 - 32) = \frac{5}{9}(63) = \frac{315}{9} = 35$

For this item, a partial-credit response (1 point) includes either

- correct temperature in degrees Celsius, 35 (degrees Celsius)
- OR**
- incorrect answer based on a calculation error (work must be shown)

For this item, a no-credit response (0 points) includes none of the features of a full- or partial-credit response.

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.EE.A3

25

Match each expression in Column A to its equivalent expression in Column B by drawing a line from the expression in Column A to the expression in Column B that is equivalent.

Column A

$$(5x + 2y) + 6$$

$$(x + y) + (x + y) + (x + 1) + (x + 1) + (x + 1)$$

$$6 + 5(2y + x)$$

$$5x + 2(2y + 3)$$

Column B

$$5(x + 2y) + 6$$

$$(5x + 4y) + 6$$

$$5x + 2(y + 3)$$

$$(5x + 2y) + 3$$

Scoring Notes:

Column A

$$(5x + 2y) + 6$$

$$(x + y) + (x + y) + (x + 1) + (x + 1) + (x + 1)$$

$$6 + 5(2y + x)$$

$$5x + 2(2y + 3)$$

Column B

$$5(x + 2y) + 6$$

$$(5x + 4y) + 6$$

$$5x + 2(y + 3)$$

$$(5x + 2y) + 3$$

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.EE.B5

26

A set of numbers is shown below.

$$\{0, 2, 3, 3.2, 4, 6.4, 10\}$$

Which numbers in the set make the inequality $5x + 1 > 17$ true? Select **all** that apply.

- A** 0
- B** 2
- C** 3
- D** 3.2
- E** 4
- F** 6.4
- G** 10

Scoring Notes:

Correct answers: E, F, G

Rationale A: reverses inequality sign

Rationale B: reverses inequality sign

Rationale C: reverses inequality sign

Rationale D: reverses inequality sign

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.EE.B6

27

Eric has n pencils. Lana has 6 fewer than twice as many pencils as Eric has. Which expression describes the number of pencils Lana has remaining after she gives away $\frac{1}{4}$ of the pencils she has?

- A $\frac{1}{4}(6 - 2n)$
- B $\frac{1}{4}(2n - 6)$
- C $\frac{3}{4}(6 - 2n)$
- D $\frac{3}{4}(2n - 6)$

Scoring Notes:

Rationale A: reverses order within parentheses and uses $\frac{1}{4}$

Rationale B: number given away

Rationale C: reverses order within parentheses

Rationale D: correct

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.EE.B7

28

Marcus earns \$50.00 washing cars. From his earnings, Marcus gives his parents \$9.45 that he borrowed to buy supplies. His profit is the amount remaining. Marcus writes an equation to determine his profit (p), in dollars. He correctly solves his equation. Which of these show both the equation Marcus could have used and his solution? Select **all** that apply.

A $50.00 = 9.45 + p$ and $p = 59.45$

B $9.45 = 50.00 - p$ and $p = 40.55$

C $p = 50.00 - 9.45$ and $p = 40.55$

D $p - 9.45 = 50.00$ and $p = 40.55$

E $50.00 + p = 9.45$ and $p = 41.55$

Scoring Notes:

Correct answers: B, C

Rationale A: equation is correct but adds instead of subtracting

Rationale D: equation is incorrect—subtracts supplies from profit instead of adding; p is correct, but not based on equation

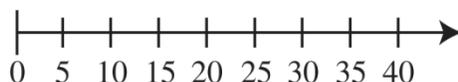
Rationale E: equation is incorrect—adds profit instead of subtracting, then ignores signs and solves as if equation is $p = 50.00 - 9.45$; makes subtraction error in solution, finds $50.00 - 9.00 = 41.00$, then finds $1.00 - 0.45 = 0.55$ and uses 41.55

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.EE.B8

29

Bobbi and Pat will combine their money and buy a gift for their friend. Bobbi wants to contribute less than \$20 toward the gift.

- A** Using the number line on the next page, create a graph that shows all the possible amounts of money, in dollars, that Bobbi could contribute toward the gift.



Pat wants to contribute more than \$12 toward the gift.

Write an inequality that shows all the possible amounts of money (x), in dollars, that Pat could contribute toward the gift.

Bobbi and Pat might not contribute the same amount toward the gift, but they will each contribute some amount.

- B** Explain why it is possible to determine the **least** total amount they could contribute toward the gift but not possible to determine the **greatest** total amount they could contribute toward the gift.

Write your response on the grid on the next page.

Scoring Notes:

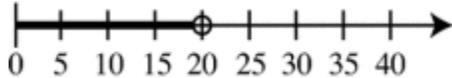
Score	Description
3	Student scores 3 points.
2	Student scores 2–2.5 points.
1	Student scores 0.5–1.5 points.
0	Student’s response provides insufficient evidence of appropriate skills or knowledge to successfully accomplish the task.
Blank	No student response.

Score Points

Part A:	score 2.0 points	correct graph and correct inequality
	OR	
	score 1.5 points	correct inequality with partially correct graph
	OR	
	score 1.0 point	correct inequality with no graph
	OR	
		correct graph with no inequality
OR		
	score 0.5 point	partially correct graph
	OR	
		some correct procedure
Part B:	score 1.0 point	correct and complete explanation
	OR	
	score 0.5 point	partially correct or incomplete explanation
	OR	
		vague explanation only

Correct Answers

Part A:



Note: A graph with an open circle at zero is also correct, but is not shown here since compound graphs are beyond 6th grade.

AND

$$x > 12$$

or equivalent

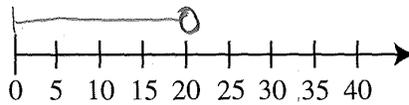
Part B: Accept all correct and complete explanations.

Sample Explanation:

It is possible to determine the least total amount because each girl will contribute some amount, and each girl has a least amount she will contribute. The greatest amount Bobbi will contribute is \$19.99 . The greatest amount Pat will contribute cannot be determined since the only information is that it is an amount greater than \$12.00 . So the greatest total amount cannot be determined.

Instructional Materials Question 29

A



$$x > 12$$

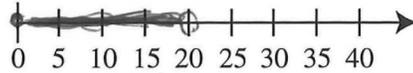
B It is possible to determine the least total amount because both children have a least amount. Pat's least amount is \$12.01 and Bobbi's is \$0.01. Therefore, the least total amount is \$12.02. It is impossible to determine the greatest total amount because only Bobbi has a maximum limit on her contribution. Pat wants to give more than \$12, so she doesn't have a maximum limit. Without Pat's greatest amount, you can't determine the total of both of them.

Score Point: 3

The response to Part A includes a correct graph and correct inequality (2.0). The response to Part B includes a correct and complete explanation (1.0).

Instructional Materials Question 29

A



Pat: $x > 12$

B It is possible to calculate the least possible amount because it is \$0 for Bobby and \$12.01 for Pat.

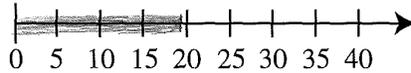
For the greatest, it would be \$19.99 for Bobby, but for ~~Pat~~ Pat, the figures would be infinite.

Score Point: 3

The response to Part A includes a correct graph and correct inequality (2.0). The response to Part B includes a correct and complete explanation (1.0).

Instructional Materials Question 29

A



$$x > 12$$

B The least total is easy to calculate, coming out at

$$\$14 \text{ Bobbi} = \$1 \text{ Pat } \$13$$

The greatest is not possible because =

$$\text{Bobbi (would have to)} = \$19 \text{ But,}$$

Pat = ∞ He can contribute infinite dollars.

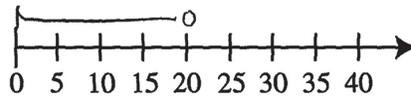
Score Point: 2

The response to Part A includes a correct inequality with partially correct graph (1.5). The response to Part B includes a correct and complete explanation (1.0).

Instructional Materials Question 29

A

Bobbi.



Pat's $x \geq 12$

B

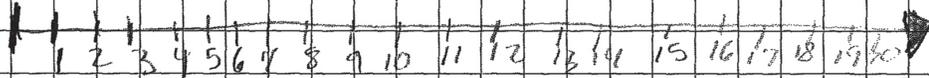
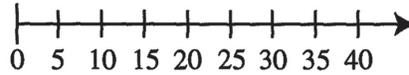
Because the least they could contribute is zero but the most could vary.

Score Point: 2

The response to Part A includes a correct graph and correct inequality (2.0). The response to Part B is incorrect (0).

Instructional Materials Question 29

A



$$x > 12$$

B

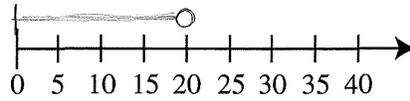
Because there is a limit on
how low they'll go but not
on how high

Score Point: 1

The response to Part A includes a correct inequality with no graph (1.0). The response to Part B includes a vague explanation (0.5).

Instructional Materials Question 29

A



$$12 \geq x$$

B because more than 12 could go on forever, but you can't go on more than 0.

Score Point: 1

The response to Part A includes a correct graph and incorrect inequality (1.0). The response to Part B includes a vague explanation (0.5).

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.EE.C9; M_6.RP.A3b

30

A store sells peaches by the pound. Lynette buys 2 pounds of peaches at the store for \$2.60 .

- A** Write an equation that describes the relationship between the number of pounds of peaches bought at the store and the total cost, in dollars, of the peaches. Use n to represent the independent variable and d to represent the dependent variable in the equation.
- B** During a sale at the store, a customer can buy 3 pounds of peaches at the regular price. Any additional number of pounds of peaches bought costs half the regular price. Explain how the **average** price per pound of peaches changes as the number of pounds bought during the sale increases. Show your work to support your explanation.

Write your response on the grid on the next page.

Scoring Notes:

Score	Description
3	Student scores 3 points.
2	Student scores 2–2.5 points.
1	Student scores 0.5–1.5 points.
0	Student’s response provides insufficient evidence of appropriate skills or knowledge to successfully accomplish the task.
Blank	No student response.

Score Points

Part A:	score 1.0 point	correct equation
	OR score 0.5 point	some correct procedure
Part B:	score 2.0 points	correct and complete explanation with correct work
	OR score 1.5 points	correct and complete explanation with partially correct work
	OR score 1.0 point	partially correct or incomplete explanation with partially correct work
	OR score 0.5 point	partially correct or incomplete explanation with no work
	OR some correct procedure OR vague explanation only	

Correct Answers

Part A: $d = 1.30n$

Part B: Accept all correct and complete explanations.

Sample Explanation:

The more pounds bought during the sale, the lower the average price per pound of peaches. For example, the price per pound when 10 pounds are purchased is less than the price per pound when 8 pounds are purchased:

$$\frac{2.60}{2} = 1.30$$

$$3 \bullet 1.30 = 3.90$$

$$5 \bullet 0.65 = 3.25$$

and

$$3.90 + 3.25 = 7.15$$

$$\frac{7.15}{8} \approx 0.89$$

$$3 \bullet 1.30 = 3.90$$

$$7 \bullet 0.65 = 4.55$$

$$3.90 + 4.55 = 8.45$$

and

$$\frac{8.45}{10} \approx 0.85$$

$$\$0.89 > \$0.85$$

Instructional Materials Question 30

A $n \times 1.3 = d$

B

$\begin{array}{r} .05 \\ 2 \overline{) 1.30} \\ \underline{-12} \\ 10 \end{array}$	$\begin{array}{r} 1.3 \\ \times 3 \\ \hline 3.90 \\ + .65 \\ \hline 4.55 \end{array}$	$\begin{array}{r} 1.375 \\ 4 \overline{) 9.55} \\ \underline{-4} \\ 15 \\ \underline{-12} \\ 30 \\ \underline{-28} \\ 20 \end{array}$	1.14	$\begin{array}{r} 1 \\ 4.55 \\ + 65 \\ \hline 5.20 \\ + 65 \\ \hline 5.85 \end{array}$	$\begin{array}{r} 1.04 \\ 5 \overline{) 5.20} \end{array}$	$\begin{array}{r} .975 \\ 6 \overline{) 5.85} \\ \underline{-54} \\ 45 \\ \underline{-42} \\ 30 \end{array}$
--	---	---	--------	--	--	--

The average price per pound of peaches decreases as the number of pounds go up.

Score Point: 3

The response to Part A includes a correct equation (1.0). The response to Part B includes a correct and complete explanation with correct work (2.0).

Instructional Materials Question 30

A

$$d = n - 1.3$$

B

$$\begin{array}{r} 3.90 \\ + 0.65 \\ \hline 4.55 \\ - 1.13 \end{array}$$

$$\begin{array}{r} 430 \\ \times 4 \\ \hline 520 \end{array}$$

520

1.04

$$\begin{array}{r} 520 \\ + 65 \\ \hline 585 \\ + 96 \\ \hline 681 \end{array}$$

$$\begin{array}{r} 130 \\ + 5 \\ \hline 135 \\ + 92 \\ \hline 227 \end{array}$$

The average decreases every time a pound is added after 3lbs because of the sale.

Score Point: 2

The response to Part A includes a correct equation (1.0). The response to Part B includes a correct and complete explanation with partially correct work (1.5).

Instructional Materials Question 30

A

$$n \cdot 1.30 = d$$

$$1 \text{ lb} = \$1.30$$

B

$$\begin{array}{r} 2 \\ 1.30 \\ \hline 2.60 \\ 1.30 \\ \hline 3.90 \\ 1.30 \\ \hline 5.20 \\ 1.30 \\ \hline 6.50 \\ 1.30 \\ \hline 7.80 \\ 1.30 \\ \hline 9.10 \\ 1.30 \\ \hline 10.40 \end{array}$$

$$\begin{array}{r} 1.30 \\ \times 3 \\ \hline 3.90 \\ + .65 \\ \hline 4.55 \end{array}$$

$$\begin{array}{r} .65 \\ 2 \overline{) 1.30} \\ \underline{- 1.20} \\ 10 \\ \underline{- 10} \\ 0 \end{array}$$

$$\begin{array}{r} 5.08 \\ 2 \overline{) 10.40} \\ \underline{- 10.40} \\ 0 \end{array}$$

As a person buys more than 3 lbs of peaches is .65, so instead of paying for 4 lbs which is \$10.40, you would pay \$5.08.

Score Point: 2

The response to Part A includes a correct equation (1.0). The response to Part B includes a partially correct explanation with partially correct work (1.0).

Instructional Materials Question 30

A $n \times \$1.30 = d$

I got \$1.30 because she bought 2 pounds for \$2.60 and you would do $\$2.60 \div 2$ to get \$1.30.

B The first 3 pounds you buy are the regular price (\$1.30) but when you buy more you pay half the regular cost (65¢). After you buy your 3 pounds you get 65¢ of each pound you buy.

$$\begin{array}{r}
 \$1.30 \\
 2 \ \$2.60 \\
 \underline{\$2.00} \\
 0.60 \\
 \underline{-0.60} \\
 0.00
 \end{array}$$

$$\begin{array}{r}
 \$0.65 \\
 2 \ \$1.30 \\
 \underline{\$1.20} \\
 10 \\
 \underline{10} \\
 0
 \end{array}$$

regular price
1 pound = \$1.30

half regular price
1 pound = \$0.65

Score Point: 1

The response to Part A includes a correct equation (1.0). The response to Part B includes some correct procedure (0.5).

Instructional Materials Question 30

A

$$2x = \$2.60$$

$$2x = \$2.60$$

B

The price changes dramatically as the price of two pounds cost the same as the original peach per pound price; $1 = \$1.30$ concerning, the price is halved. $\frac{1}{2}$ price = $\$0.65$ added

Peaches	Cost
1 pound	\$1.30
2 pounds	\$2.60
3 pounds	\$3.90
4 pounds	\$4.95
5 pounds	\$5.20
6 pounds	\$5.85
7 pounds	\$6.50
8 pounds	\$7.15
9 pounds	\$7.80

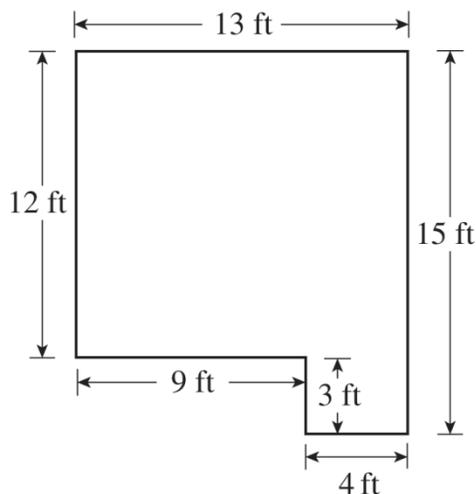
} \$1.20
} 65¢
} ↓
} ↓

Score Point: 1

The response to Part A is incorrect (0). The response to Part B includes an incomplete explanation with partially correct work (1.0).

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.G.A1

- 31** The dimensions of the floor in a room in Sheila's house are shown in the diagram below.



Which expressions could Sheila use to determine the total area, in square feet, of the floor in the room? Select **all** that apply.

- A $(12 \cdot 13) + (3 \cdot 4)$
- B $(12 \cdot 9) + (15 \cdot 4)$
- C $(12 \cdot 9) + (12 \cdot 4)$
- D $(15 \cdot 13) - (3 \cdot 4)$
- E $(15 \cdot 13) - (3 \cdot 9)$

Scoring Notes:

Correct answers: A, B, E

Rationale C: uses height on left only

Rationale D: subtracts incorrect rectangle from total area

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.G.A2

32 Ernie is using two boxes shaped like rectangular prisms. The boxes are described below.

- The dimensions of box A are $10\frac{1}{2}$ in by $10\frac{1}{2}$ in by $15\frac{1}{2}$ in.
- The area of the base of box B is $98\frac{1}{4}$ in². The height of the box is $10\frac{1}{2}$ in.

What is the difference in the volumes of the two boxes? Write the answer in the blank below.

_____ in³

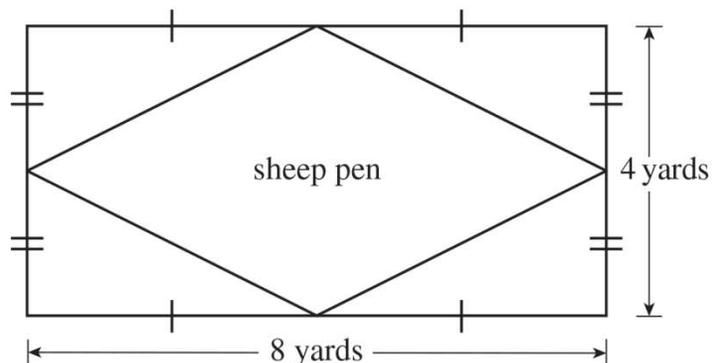
Scoring Notes:

$$677\frac{1}{4} \text{ (in}^3\text{)}$$

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.G.A1

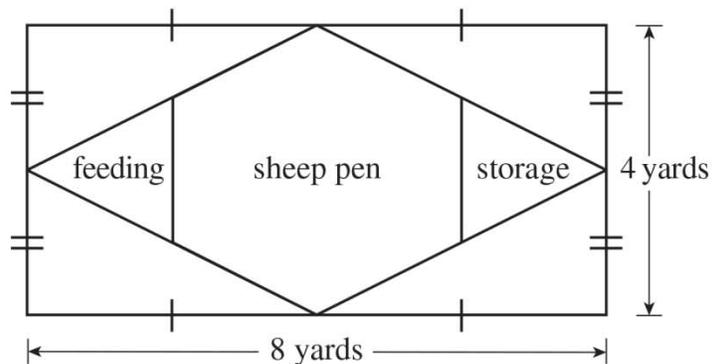
33

Mr. Danton is a farmer who owns sheep. In a rectangular area of his farm he has a sheep pen that is shaped like a rhombus, as pictured below.



A What is the area, in square yards, of the sheep pen? Show your work or explain your thinking.

Mr. Danton decides that he will use two triangular sections at either end of the sheep pen for feeding and storage, as pictured below. Each section will have a base length of 2 yards and a height of 2 yards.



B Explain why the area of the pen remaining for the sheep must be 3 times as great as the total area Mr. Danton will use for feeding and storage.

Write your response on the grid on the next page.

Scoring Notes:

Score	Description
3	Student scores 3 points.
2	Student scores 2–2.5 points.
1	Student scores 0.5–1.5 points.
0	Student’s response provides insufficient evidence of appropriate skills or knowledge to successfully accomplish the task.
Blank	No student response.

Score Points

Part A:	score 1.5 points	correct answer with correct and complete work or explanation
	OR	
	score 1.0 point	correct answer with partially correct work or incomplete explanation
	OR	incorrect answer due to a calculation error (work must be shown)
OR		
	score 0.5 point	correct answer with no work or explanation
	OR	some correct procedure
	OR	vague explanation only
Part B:	score 1.5 points	correct and complete explanation
	OR	
	score 1.0 point	partially correct or incomplete explanation
	OR	
score 0.5 point	vague explanation only	
	OR	some correct procedure

Correct Answers

Part A: 16 (square yards)

$$\frac{8 \cdot 4}{2} = 16$$

or equivalent work

OR

Sample Explanation:

The pen is a rhombus and the lengths of the diagonals are equal to the length and width of the rectangle. The area of the rhombus can be found by multiplying diagonal 1 by diagonal 2 and then dividing by 2, so $\frac{8 \cdot 4}{2} = 16$. The area of the rhombus is 16 square yards.

Part B: Accept all correct and complete explanations.

Sample Explanation:

The area remaining is shaped like a hexagon and can be divided into 1 rectangle and 2 triangles of the same size. The rectangle must be 2 yards wide because the base of each triangle is 2 yards. The rectangle must have a length of 4 yards because the entire rectangle is 8 yards wide and 4 yards are remaining when subtracting $8 - (2 + 2)$ for the heights of the triangular sections.

Because the length of the rectangle is 4 yards, the base of each remaining triangle in the hexagon is 4 yards. And the height of each remaining triangle in the hexagon must be 1 yard because the entire rectangle is 4 yards wide and 2 yards are remaining when subtracting $4 - 2$ for the base length of the triangular sections.

So the area of the hexagon is 12 square yards because $(2 \cdot 4) + 2(0.5 \cdot 4 \cdot 1) = 12$. And since the base length of each triangular section is 2 yards, and the height is 2 yards, and $(0.5 \cdot 2 \cdot 2) = 2$, then each triangle has an area of 2 square yards. 12 is 3 times as great as 4 (from $2 + 2$), so the hexagon has an area that is 3 times as great as the areas used for feeding and storage.

Instructional Materials Question 33

A

4 yds

8 yds

$4 \times 4 = 16 \text{ yds}^2$

$(4 \cdot 2(\frac{1}{2})) = 4$

$(4 \cdot 1) = 4$

$4 = 4$

$32 - 4(4)$

$32 - 16$

16

B

$2(2 \times 2(\frac{1}{2}))$

$2(2 \cdot 1)$

$2(2)$

4

$\frac{16}{4} = 4$

The pen is now 12 yds², with the storage & feeding being 4 yds² it is 3 times smaller.

Storage excluding feeding
↓
4 yds²

(remaining pen)

$4 \cdot 3 = 12$

how much larger

Score Point: 3

The response to Part A includes the correct answer with correct and complete work (1.5). The response to Part B includes a correct and complete explanation (1.5).

Instructional Materials Question 33

A

$A = 4$

$A = 4$

$A = 4$

$A = 4$

8 yds

4 yds

$8 \times 4 = 32$

$\begin{array}{r} 32 \\ - 16 \\ \hline 16 \end{array}$

$A = 16 \text{ yd}^2$

$A_{\Delta} = \frac{1}{2}bh$

I subtracted the area of each triangle from the area of the entire rectangle to get the area of the rhombus.

B

The space remaining is 3 times that amount, because $16 \text{ yd}^2 - 4 \text{ yd}^2 = 12 \text{ yd}^2$. $3 \times 4 = 12$. This means that the area of the sheep pen is 3 times the area of the feeding and storage areas.

$16 - (2+2) = 12$

$A = 2$

$A = 16$

$A = 2$

Score Point: 2

The response to Part A includes the correct answer with correct and complete work (1.5). The response to Part B includes an incomplete explanation (1.0).

Instructional Materials Question 33

A 8 times if it is 32, so 32 divided by 2 is 16. You divide 32 by 2 because a rhombus is not perfectly square and the rhombus only take up half of the area of the pen, so he is using 16 yards of area for the pen.

B because he is using four yards of area for the feeding and storage area so he is left with twelve yards of area. 12 divided by 4 is 3 so his sheep pen will use 12 yards of area and is therefore 3 times as much as the feeding and bedding sections which take up 4 yards of area.

Score Point: 2

The response to Part A includes the correct answer with incomplete explanation (1.0). The response to Part B includes an incomplete explanation (1.0).

Instructional Materials Question 33

A

$A = B \cdot H$
 $A_{\Delta} = B \cdot H \div 2$ $8 \text{ yd}^2 \cdot 2 = 16$

4 yd

4 yd

4 yd

8 yd

16 yd² (SHEEP PEN)

$4 \cdot 4 = 16 \div 2 = 8 \text{ yd}^2$

B

Score Point: 1

The response to Part A includes the correct answer with correct and complete work (1.5). The response to Part B is missing (0).

Instructional Materials Question 33

A $8 \times 4 = 32$ $\div 2 = 16$ This is the area because the rectangle has an area of 32 and the rhombus is the actual sheep pen so the rhombus is half the size of the rectangle so you would have to do $32 \div 2$ and that's 16 so 16 is the area of the rhombus.

B Because there needs to be enough room for Mr. Danton to put all his sheep, also there's got to be enough room for them to walk a little so they don't get weak also there's got to be enough room for them to eat and sleep.

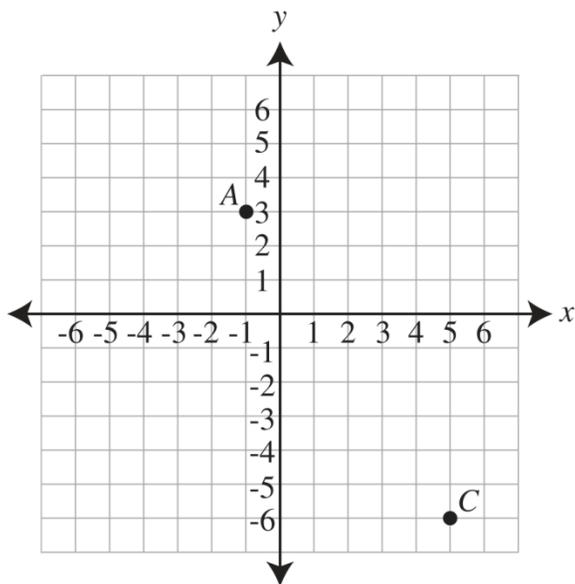
Score Point: 1

The response to Part A includes the correct answer with incomplete explanation (1.0). The response to Part B is incorrect (0).

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.G.A3

34

Vertex A and vertex C of rectangle $ABCD$ are graphed on the coordinate plane below.



What is the perimeter, in units, of rectangle $ABCD$? Explain your thinking. As part of your explanation, list the ordered pairs that describe the locations of vertex B and vertex D .

Write your response on the grid below.

Scoring Notes:

For this item, a full-credit response (2 points) includes

- correct perimeter of rectangle $ABCD$, 30 (units)

AND

- correct ordered pairs, $(5, 3)$ and $(-1, -6)$

AND

- explanation indicating how the perimeter of rectangle $ABCD$ was determined

For example,

- Vertex B and vertex D must be located at $(5, 3)$ and $(-1, -6)$ because the sides of a rectangle are straight and these points are where the sides would meet to form right angles. The distance between vertex A and vertex B is 6 units, and the distance between vertex B and vertex C is 9 units. The perimeter is 30 units, because $2(6 + 9) = 30$.

For this item, a partial-credit response (1 point) includes either

- correct perimeter of rectangle $ABCD$, 30 (units)

OR

- correct ordered pairs, $(5, 3)$ and $(-1, -6)$

OR

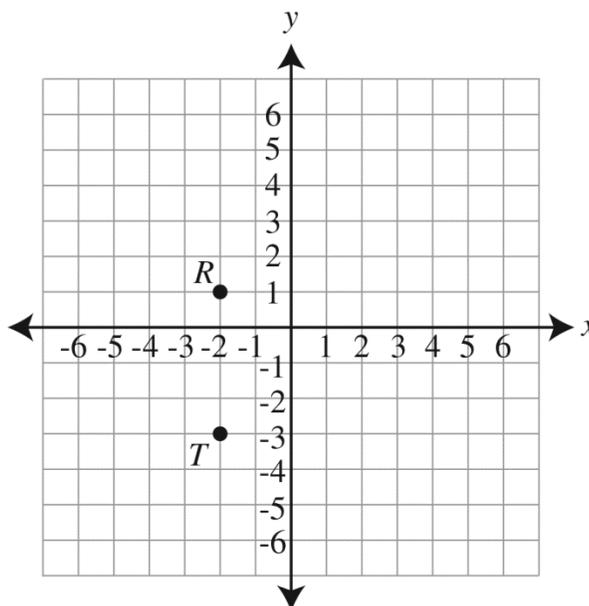
- some explanation indicating how the perimeter of rectangle $ABCD$ was determined

For this item, a no-credit response (0 points) includes none of the features of a full- or partial-credit response.

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.G.A3; M_6.G.A1

35

Point R and point T are shown on the coordinate plane below.



When point S is graphed on the coordinate plane, right triangle RST is formed. The area of triangle RST is 16 square units.

Graph one possible location of point S on the coordinate plane, and connect all 3 points with line segments to form right triangle RST .

Scoring Notes:

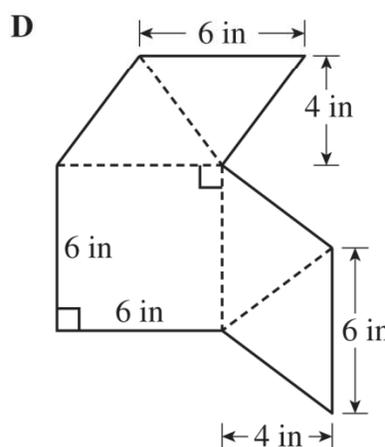
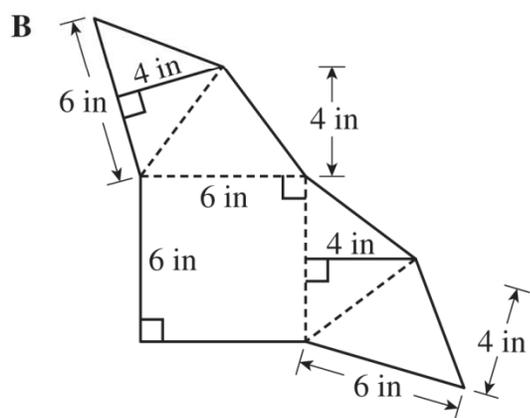
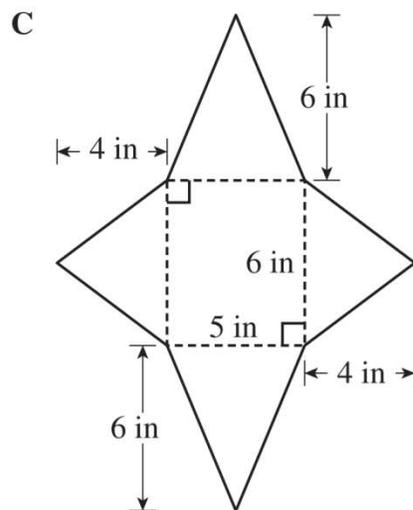
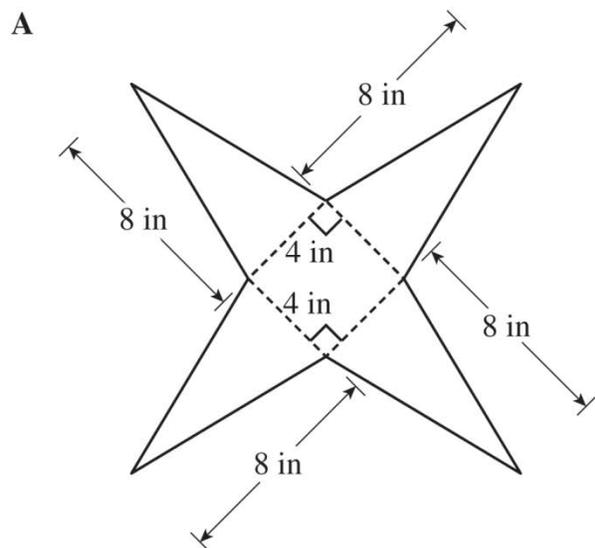
Point S could be located at either $(6, 1)$ or $(6, -3)$ on this coordinate plane. Sides of triangle RST are drawn connecting the 3 points.

(Note: Side lengths would be 4 units and 8 units for an area of 16 square units.)

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.G.A4

36

Which net could be folded along the dashed line segments to create a square pyramid with a surface area of 84 square inches?



Scoring Notes:

Rationale A: makes a square pyramid but incorrect surface area

Rationale B: correct

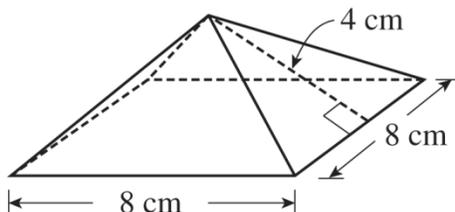
Rationale C: correct surface area, not a pyramid

Rationale D: correct surface area, not a pyramid

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.G.A4

37

A square pyramid is pictured below.



What is the surface area of the pyramid? Show your work.

Write your response on the grid below.

Scoring Notes:

For this item, a full-credit response (2 points) includes

- correct surface area of pyramid, 128 cm^2

AND

- correct work

For example,

- $8 \cdot 8 = 64$

$$\frac{1}{2} \cdot 8 \cdot 4 = 16$$

$$64 + 4 \cdot 16 = 128$$

For this item, a partial-credit response (1 point) includes either

- correct surface area of pyramid, 128 cm^2

OR

- incorrect answer based on a computation error (work must be shown)

For this item, a no-credit response (0 points) includes none of the features of a full- or partial-credit response.

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.SP.A1

38

Which of these are **best** considered to be statistical questions? Select **all** that apply.

- A** How many legs does a dog have?
- B** How many minutes of exercise does a dog need each day?
- C** How many students in a school own dogs?
- D** Which types of dogs are owned by the students in a school?
- E** What is the age of each dog owned by a student in a school?

Scoring Notes:

Correct answers: B, D, E

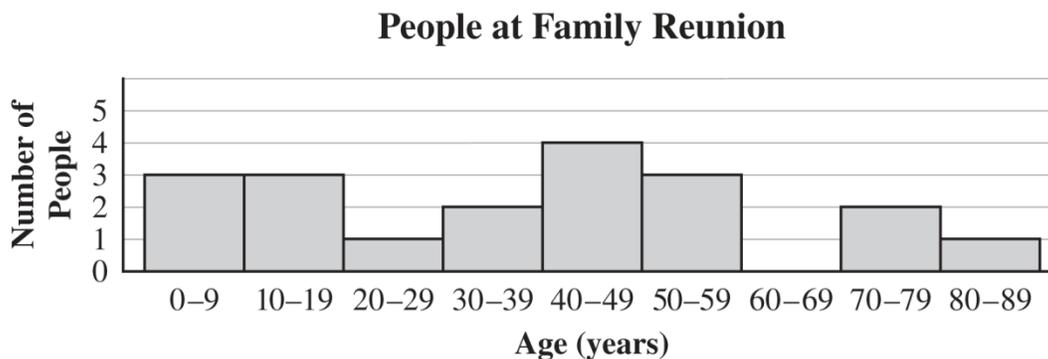
Rationale A: will result in one answer, with no variability

Rationale C: will result in one answer, with no variability

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.SP.A2

39

The histogram below represents the distribution of the ages, in years, of all the people at a family reunion.



Which statement **best** describes the overall shape of the distribution?

- A There is a central gap in the data, and the data are symmetrical about that gap.
- B There is a central peak in the data, and the data are symmetrical about that peak.
- C There is a central gap in the data, but the data are not symmetrical about that gap.
- D There is a central peak in the data, but the data are not symmetrical about that peak.

Scoring Notes:

Rationale A: gap is not central, data not symmetrical about gap

Rationale B: 4 age ranges on either side of peak

Rationale C: data is not symmetrical about the gap, and gap is not central

Rationale D: correct

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.SP.A3; M_6.SP.B5d

40

Naomi travels to school by walking or riding a bike. The number of minutes it took Naomi to travel to school each day last week is shown below.

5 14 15 11 15

A statement and three tables are shown below. Circle one option from each table to complete the statement.

Naomi uses the of the data to describe how the values vary with a single number. This number is , and it represents a measure of for the data.

Option 1
mean
median
interquartile range
mean absolute deviation

Option 2
3.2
4
12
14

Option 3
center
variability

Scoring Notes:

Option 1: interquartile range

Option 2: 4

Option 3: variability

OR

Option 1: mean absolute deviation

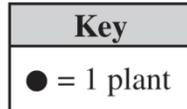
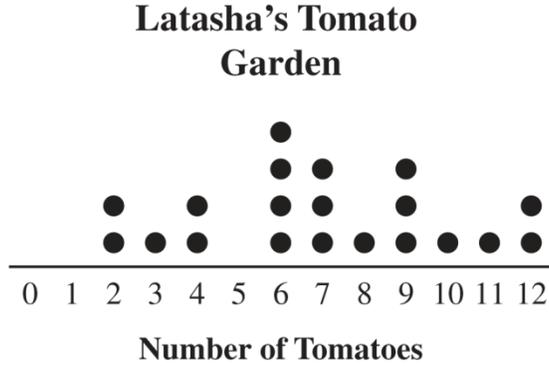
Option 2: 3.2

Option 3: variability

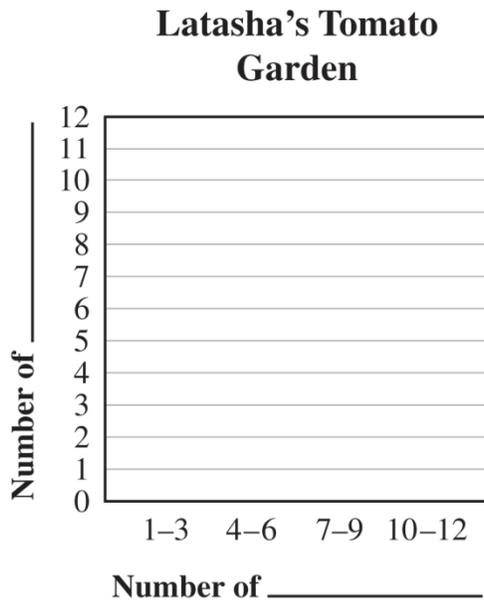
Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.SP.B4

41

The dot plot below shows the number of tomatoes growing on each plant in Latasha’s tomato garden.

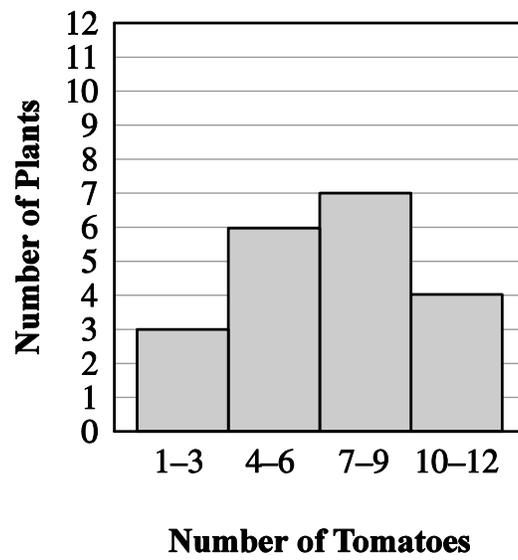


Use the information shown in the dot plot to complete the histogram below. Be sure to complete the labels on the axes of the histogram.



Scoring Notes:

Latasha's Tomato Garden



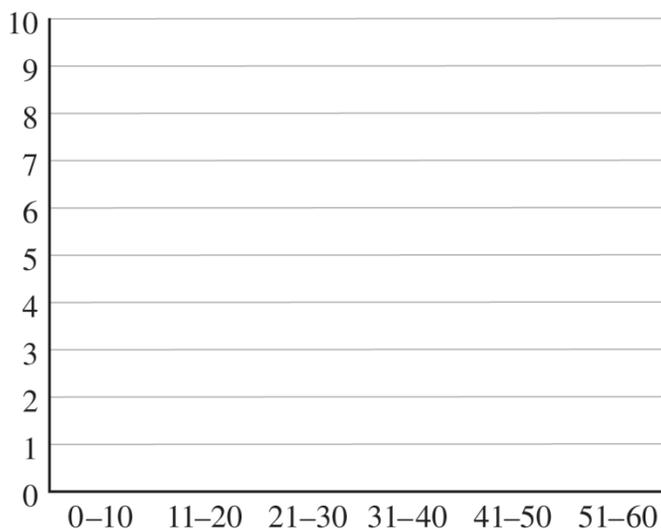
Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.SP.B4; M_6.SP.B5

42

Cara surveyed each teacher in her school about his or her average commute time, in minutes, from home to school. The data she recorded are listed below.

7 18 9 10 24 49 8 10 15 57 17
15 9 54 20 26 5 28 13 30 52 8

- A** Using the axes and scales on the next page, create a histogram that represents the teachers' average commute times. Be sure to include a title and completely label both axes.



- B** Without doing any calculations, explain why the **mean** of the data and the **median** of the data are likely to be located within different ranges on the horizontal scale.

Write your response on the grid on the next page.

Scoring Notes:

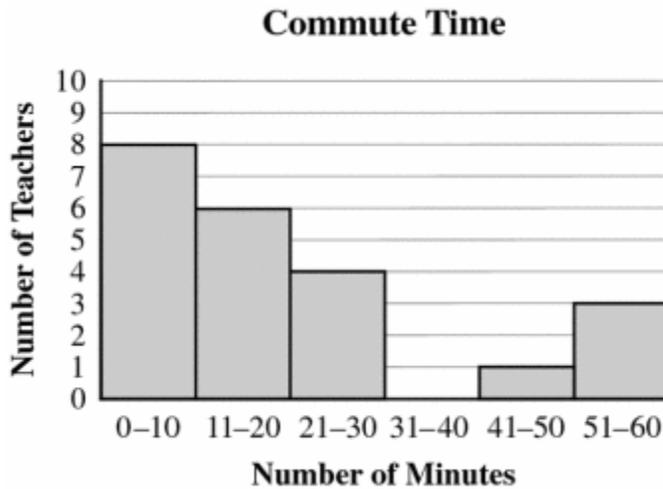
Score	Description
3	Student scores 3 points.
2	Student scores 2–2.75 points.
1	Student scores 0.25–1.75 points.
0	Student’s response provides insufficient evidence of appropriate skills or knowledge to successfully accomplish the task.
Blank	No student response.

Score Points

- Part A:** score 2.0 points correct and complete histogram (includes title and labels on both axes)
deduct 0.25 for each incorrect range
deduct 0.25 for each missing label
deduct 0.25 for missing title
deduct 0.25 for separation between bars
(maximum deduction of 2.0 points)
- Part B:** score 1.0 point correct and complete explanation
OR
score 0.5 point partially correct or incomplete explanation
OR
vague explanation only

Correct Answers

Part A: Correct and complete histogram including title and labels on both axes.



Part B: Accept all correct and complete explanations.

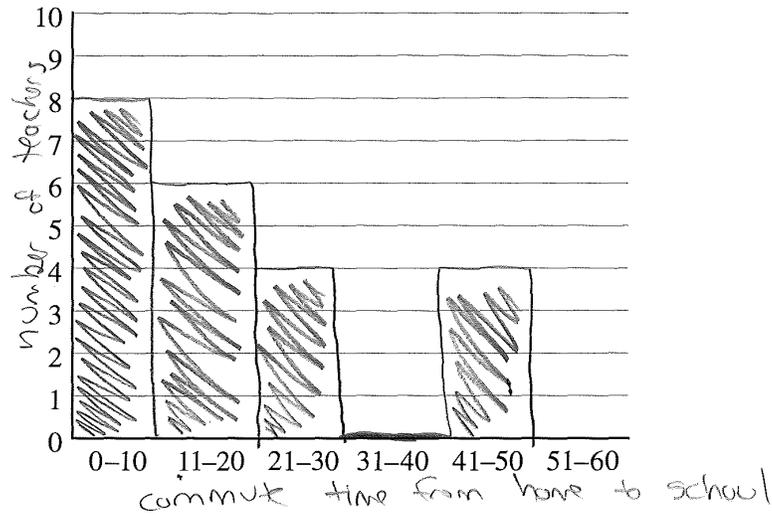
Sample Explanation:

The data are skewed to the left of the histogram, which means more data points exist in the lower ranges. The median will likely fall somewhere in the middle of all the data clustered on the left of the histogram, probably in the 11–20 range. The mean will likely fall in a range with greater numbers, probably the 21–30 range, since it is affected by the greater data points in the ranges on the right of the histogram.

No 3-point responses

Instructional Materials Question 42

A



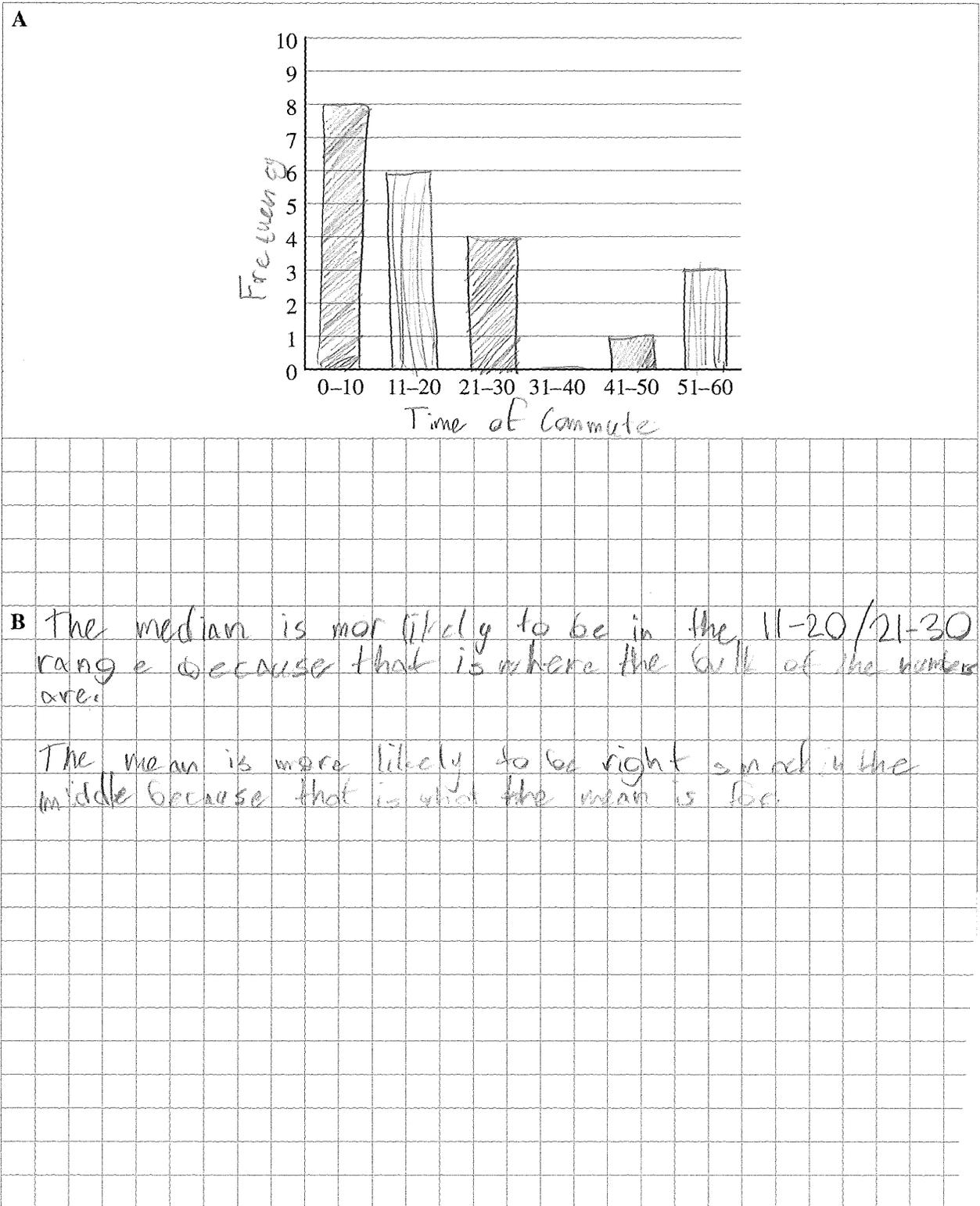
B They would be in different ranges because the median would have to balance the histogram, and since it isn't symmetrical, it would be toward the front while the average would be in the back because of higher data numbers.

Score Point: 2

The response to Part A includes a histogram with missing title and two incorrect ranges (1.25).

The response to Part B includes a correct and complete explanation (1.0).

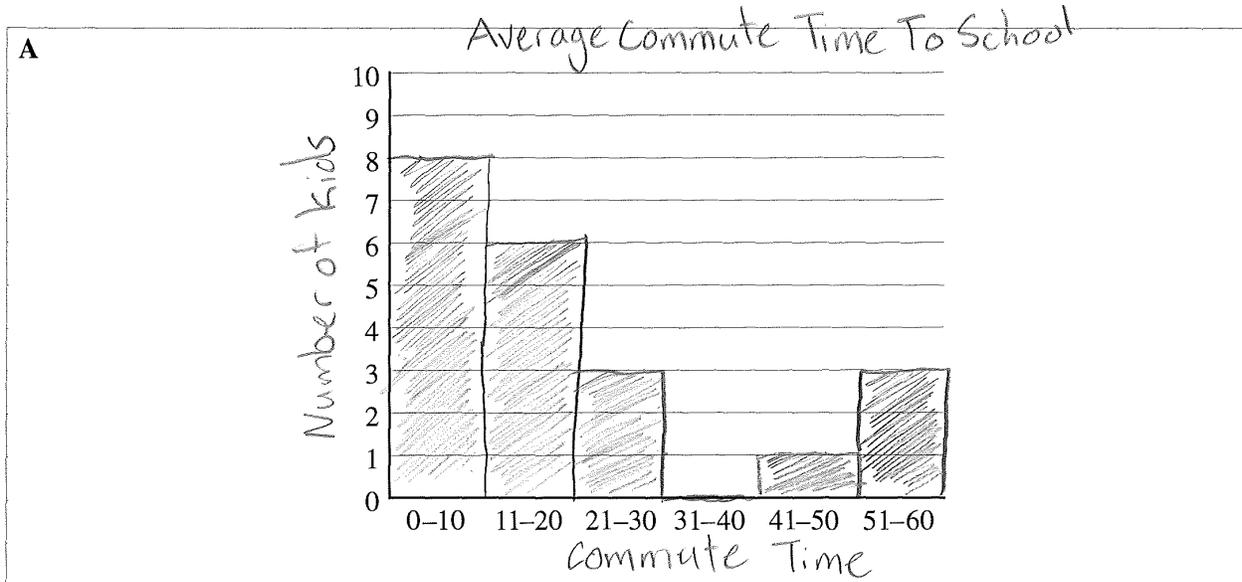
Instructional Materials Question 42



Score Point: 2

The response to Part A includes a histogram with missing title and separation between bars (1.5). The response to Part B includes a partially correct explanation (0.5).

Instructional Materials Question 42

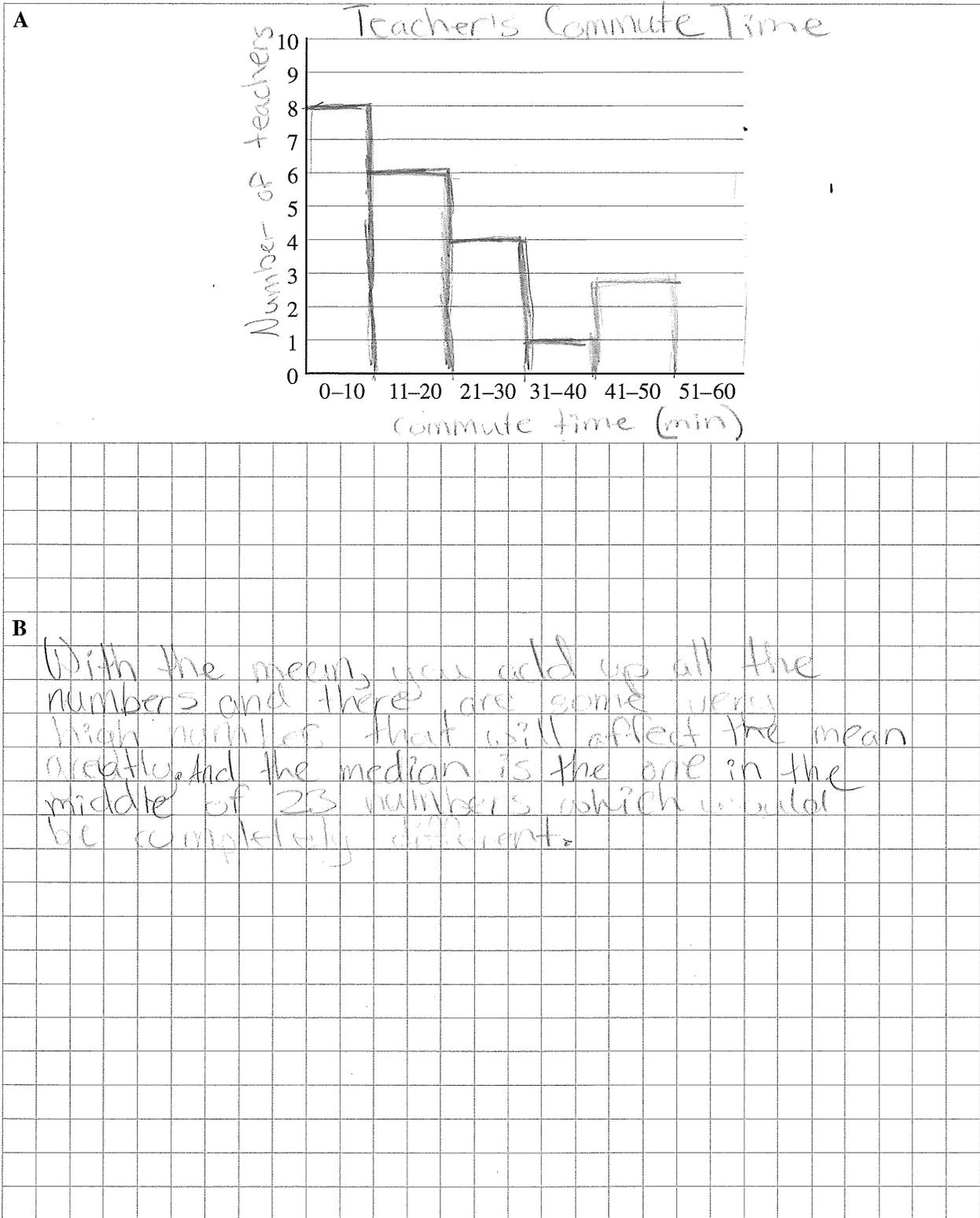


B The mean is most likely going to be in the lower numbers and because you cross off the beginning numbers so it would not be in the lower numbers.

Score Point: 1

The response to Part A includes a histogram with one incorrect range (1.75). The response to Part B is incorrect (0).

Instructional Materials Question 42



Score Point: 1

The response to Part A includes a histogram with three incorrect ranges (1.25). The response to Part B includes a vague explanation (0.5).

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.SP.B5c

43

The table below shows information about the number of pets owned by 9 of 10 students.

Pets Owned

Student	Number of Pets Owned	Deviation from Mean
Abby	1	-1
Bill	0	-2
Carlos	2	0
Donna	2	0
Erin	2	0
Frank	3	1
Gary	1	-1
Hannah	2	0
Irene	2	0
Jacob		

Use the information in the table to determine the number of pets owned by Jacob and the deviation of that number from the **mean** number of pets owned by all 10 students. Write the answers in the table.

What is the **mean absolute deviation** of the number of pets owned by all 10 students? Write the answer in the blank below.

Scoring Notes:

Pets Owned

Student	Number of Pets Owned	Deviation from Mean
Abby	1	-1
Bill	0	-2
Carlos	2	0
Donna	2	0
Erin	2	0
Frank	3	1
Gary	1	-1
Hannah	2	0
Irene	2	0
Jacob	5	3

mean absolute deviation: 0.8

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.SP.B5d

44

Alan saves money from his part-time job. The amounts he saved during the past few weeks are listed below.

\$17.00 \$20.00 \$22.00 \$23.00 \$25.00 \$88.00

Which dollar amount represents the **best** measure of center of the amounts saved?

- A \$17.00
- B \$22.50
- C \$32.50
- D \$73.00

Scoring Notes:

Rationale A: minimum

Rationale B: correct

Rationale C: assumes mean is always best measure of center

Rationale D: range; not a measure of center

Nevada Instructional Materials Phase III
Grade 6 Mathematics
NVACS: M_6.SP.B5d; M_6.SP.B5c

45

The annual salaries, in dollars, of six actors are listed below.

20,000 22,000 25,000 47,000 54,000 60,000

Based on the shape of the data distribution, which statistical measure could be considered the **best** measure of center of the actors' salaries, and what is its value? Explain why the measure you chose could be considered the **best** measure of center of the actors' salaries.

Write your response on the grid below.

Scoring Notes:

For this item, a full-credit response (2 points) includes

- best measure of center of salaries and its value, median: \$36,000
OR
- best measure of center of salaries and its value, mean: \$38,000
AND
- explanation indicating why the statistical measure chosen is considered best measure of center

For example,

- Median: If the data were plotted on a number line in a dot plot or line plot, the shape would be fairly symmetrical. This is because there are an equal number of salaries to the right and left of the median. When a data distribution is symmetrical, the median could be considered the best measure of center.
OR
- Mean: If the data were plotted on a number line in a dot plot or line plot, the shape would be fairly symmetrical. This is because all the data are very similar in value, and there are no outliers. When there are no outliers, the mean could be considered the best measure of center.

For this item, a partial-credit response (1 point) includes either

- best measure of center of salaries and its value, median: \$36,000
OR
- best measure of center of salaries and its value, mean: \$38,000
OR
- some explanation indicating why the statistical measure chosen is considered best measure of center

For this item, a no-credit response (0 points) includes none of the features of a full- or partial-credit response.



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