



# NEVADA INSTRUCTIONAL MATERIALS

FOR THE  
NEVADA ACADEMIC CONTENT STANDARDS FOR MATHEMATICS

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# Grade 7

TEACHER EDITION



# Scoring Support Materials

## Grade 7 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	7.RP.A1	1	C
2	7.RP.A2c	2	-----
3	7.RP.A1	2	-----
4	7.RP.A2a	2	-----
5	7.RP.A2b	1	A, D
6	7.RP.A2d	2	-----
7	7.RP.A3	2	A
8	7.RP.A3	2	-----
9	7.RP.A3	3	-----
10	7.NS.A1a	1	B
11	7.NS.A1b	2	B, C
12	7.NS.A1c	2	-----
13	7.NS.A1d	1	C, F
14	7.NS.A2b	2	-----
15	7.NS.A2c	1	A, E, F
16	7.NS.A3	1	D
17	7.NS.A3	2	A, D
18	7.EE.A1	1	-----
19	7.EE.A2	1	B
20	7.EE.B3	2	-----
21	7.EE.B3	3	-----
22	7.EE.B4a	2	D
23	7.EE.B4b	2	-----

Item Number	NVACS*	DOK	Answers
24	7.G.A1	2	C
25	7.G.A1	2	-----
26	7.G.A2	2	-----
27	7.G.A3	2	A, B, D
28	7.G.A3	3	-----
29	7.G.B4	2	C
30	7.G.B5	1	-----
31	7.G.B5	2	B, D, E
32	7.G.B6	2	-----
33	7.G.B6	2	-----
34	7.SP.A1	3	-----
35	7.SP.A2	2	A, B, E
36	7.SP.A2	3	-----
37	7.SP.B3	2	A, B
38	7.SP.C5	1	D
39	7.SP.C7a	2	-----
40	7.SP.C5	1	-----
41	7.SP.C6	3	-----
42	7.SP.C7a	3	-----
43	7.SP.C7b	2	A
44	7.SP.C8a	2	-----
45	7.SP.C8b	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 7  
Mathematics**

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.RP.A1**

**1**

A baker makes  $\frac{1}{3}$  of a batch of doughnuts every  $\frac{1}{4}$  hour. She continues to make doughnuts at this rate. How many batches of doughnuts does she make in 6 hours?

- A  $3\frac{1}{2}$  batches
- B  $4\frac{1}{2}$  batches
- C 8 batches
- D 12 batches

**Scoring Notes:**

**Rationale A:** adds  $\frac{1}{3} + \frac{1}{4}$  to get unit rate of  $\frac{7}{12}$  batch per hour, multiplies by 6

**Rationale B:** finds  $\left(\frac{1}{4}\right)\left(\frac{1}{3}\right)$  and gets  $\frac{3}{4}$  batch per hour, multiplies by 6

**Rationale C:** correct

**Rationale D:** inverts  $\frac{1}{3}$  and  $\frac{1}{4}$  and multiplies; ignores the 6

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.RP.A2c**

**2**

Beach markers are placed every  $\frac{1}{12}$  mile along a beach. Lance walked past 18 beach markers in 20 **minutes**. Complete the equation below by writing a number in the box so that the equation correctly describes the distance ( $d$ ), in miles, that Lance would walk on the beach in  $t$  **hours** when continuing to walk at the same rate.

$$d = \boxed{\phantom{000}} \cdot t$$

**Scoring Notes:**

4.5 or  $\frac{9}{2}$  or equivalent

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.RP.A1**

- 3** Katie traveled  $\frac{3}{32}$  of the way along a 4-mile trail by jogging for  $\frac{1}{10}$  hour. What is Katie's average jogging rate, in miles per hour? Show your work or explain your thinking.

Write your response on the grid below.

**Scoring Notes:**

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

- correct average jogging rate in miles per hour,  $3\frac{3}{4}$  (miles per hour)

**AND**

- correct work or explanation indicating how the average jogging rate was determined

For example,

- $\frac{3}{8} \div \frac{1}{10} = \frac{30}{8} = \frac{15}{4} = 3\frac{3}{4}$

**OR**

- Katie jogged  $\frac{3}{32} \bullet 4 = \frac{3}{8}$  mile in  $\frac{1}{10}$  hour, so her rate was  $\frac{3}{8} \div \frac{1}{10} = \frac{30}{8} = \frac{15}{4} = 3\frac{3}{4}$  miles per hour.

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

- correct average jogging rate in miles per hour,  $3\frac{3}{4}$  (miles per hour)

**OR**

- some explanation indicating how the average jogging rate was found

**OR**

- incorrect average jogging rate due to 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 7 Mathematics**  
**NVACS: M\_7.RP.A2a**

**4**

Sue earns some money by babysitting. The table below shows the different numbers of hours she babysits and the amounts of money she earns.

**Sue's Babysitting**

<b>Number of Hours Sue Babysits</b>	<b>Amount Earned (\$)</b>
2.5	15.00
3.0	16.50
4.0	26.00
6.0	36.00

Determine whether the relationship shown in the table, between the number of hours Sue babysits and the amount she earns, is proportional or is not proportional.

- If you determine that the relationship is proportional, go to **Part A**.
- If you determine that the relationship is **not** proportional, go to **Part B**.
- Only complete **Part A** or **Part B**; do not complete both.

**A** The relationship between the number of hours Sue babysits and the amount she earns is proportional. Circle **all** the pairs of numbers of hours Sue babysits and amounts she earns that could be added to the table so that the relationship would remain proportional.

2.0 hours    \$12.00

5.5 hours    \$30.25

8.0 hours    \$48.00

9.0 hours    \$58.50

**B** The relationship between the number of hours Sue babysits and the amount she earns is **not** proportional. Circle **all** the changes that must be made to the table so that the relationship would be proportional.

\$16.50 must be changed to \$18.00 .

\$16.50 must be changed to \$22.00 .

\$26.00 must be changed to \$19.50 .

\$26.00 must be changed to \$24.00 .

**Scoring Notes:**

Part B should be selected with the following changes circled:

\$16.50 must be changed to \$18.00 .

\$26.00 must be changed to \$24.00 .

**Rationales:**

Part A selected:

only looks at first and last row in table

(and subsequently, 2.0 hours/\$12.00 and 8.0 hours/\$48.00 should be circled)

Part B selected **and**:

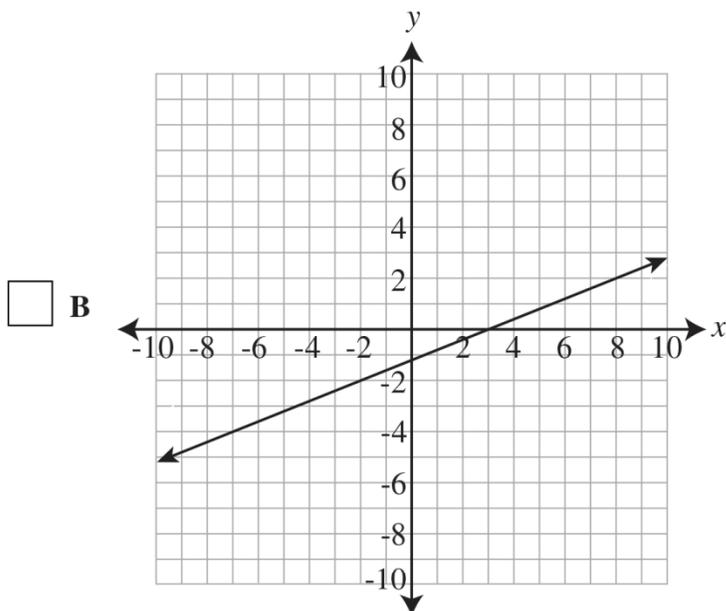
\$16.50 must be changed to \$22.00 selected (whole dollar amount between \$15.00 and \$26.00)

\$26.00 must be changed to \$19.50 selected (doubles the increase of 0.5/1.5 between first two rows)

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.RP.A2b**

**5** In which of these proportional relationships is the constant of proportionality, which relates  $x$  to  $y$ ,  $\frac{5}{2}$ ? Select **all** that apply.

**A**  $8y = 20x$



**C**

$x$	10	20	30	40
$y$	5	10	15	20

**D** The distance ( $x$ ) Sergio walked relates to the time ( $y$ ) spent walking. He walked a total of 25 feet in 10 seconds. He walked a total of 125 feet in 50 seconds.

**E**  $\frac{y}{2} = \frac{x}{5}$

**Scoring Notes:**

**Correct answers:** A, D

**Rationale B:** slope of  $\frac{2}{5}$ ; does not pass through origin

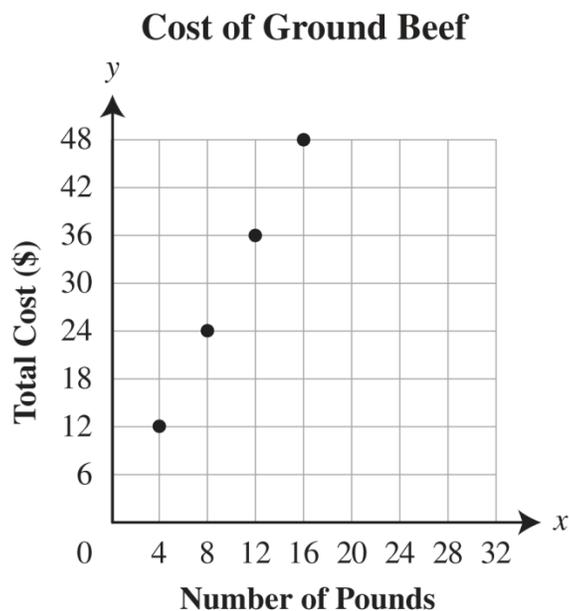
**Rationale C:** confuses  $\frac{10}{5} = 2$  with unit rate of  $\frac{5}{2}$

**Rationale E:** thinks of  $\frac{x}{y} = \frac{5}{2}$ , unit rate is  $\frac{2}{5}$

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.RP.A2d; M\_7.RP.A2b**

**6**

The graph below represents the relationship between the number of pounds ( $x$ ) of ground beef that a chef purchases and the total cost ( $y$ ) of the ground beef.



Write an ordered pair to describe the total cost of one pound of ground beef. Show your work or explain your thinking.

Write your response on the grid below.

## Scoring Notes:

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

- correct ordered pair, (1, 3)
- AND**
- correct work or explanation indicating how the total cost of one pound of ground beef was determined

For example,

- $\frac{4}{12} = \frac{1}{y}$   
 $4y = 12$   
 $y = 3$
- OR**
- Since the  $x$ -axis represents the number of pounds purchased, then the  $x$ -coordinate of the ordered pair is 1 to represent 1 pound of ground beef. The  $y$ -coordinate of the ordered pair represents the cost of the beef. The graph shows a proportional relationship, so I can use the coordinates from an ordered pair shown on the graph in a proportion to determine the value of  $y$  when the value of  $x$  is 1. Using the ordered pair (4, 12) and solving the proportion, the cost of 1 pound of beef is \$3, and this is represented by the ordered pair (1, 3).

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

- correct ordered pair, (1, 3)
- OR**
- correct work indicating how the total cost of one pound of ground beef was determined
- OR**
- some explanation indicating how the total cost of one pound of ground beef was determined
- OR**
- incorrect ordered pair due to 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 7 Mathematics**  
**NVACS: M\_7.RP.A3**

**7** John earns a 15% commission on the price of each item he sells. The original price of an item is \$120.00 . During a sale, the original price of the item is discounted. John sells the item at the discounted price and earns \$16.20 in commission. What is the percent of the sales discount on the item?

- A 10.0%
- B 10.8%
- C 13.5%
- D 18.0%

**Scoring Notes:**

**Rationale A:** correct

**Rationale B:** finds  $\frac{16.20}{15}$  , gets sale price of 108, but changes to a percent

**Rationale C:** finds  $\frac{16.20}{120}$  , the percent of the original price John gets as commission

**Rationale D:** finds the commission on the original price, or  $(0.15)(120)$  , and changes to a percent

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.RP.A3**

**8** Five stores in different states are selling the same item at a retail price of \$100 . Each store offers a discount on the item and collects sales tax on the discounted price.

- Store A offers a 5% discount and collects 1% sales tax from the customer.
- Store B offers a 5% discount and collects 5% sales tax from the customer.
- Store C offers a 5% discount and collects 10% sales tax from the customer.
- Store D offers a 10% discount and collects 5% sales tax from the customer.

Place a check mark in **each** row of the table below to indicate whether a customer who buys the item at each store pays less than \$100, exactly \$100, or more than \$100 .

**Price Comparison by Store**

Store	Customer Pays Less Than \$100	Customer Pays \$100	Customer Pays More Than \$100
Store A			
Store B			
Store C			
Store D			

**Scoring Notes:**

**Price Comparison by Store**

Store	Customer Pays Less Than \$100	Customer Pays \$100	Customer Pays More Than \$100
Store A	✓		
Store B	✓		
Store C			✓
Store D	✓		

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.RP.A3**

**9** A store buys a television for an original cost of \$360.00 . The store sells the television for \$450.00 .

**A** What is the percent markup that the store adds to its original cost of the television? Show or explain all your work.

Another store buys the same television for an original cost of \$360.00 . The percent markup that this store adds to its original cost of the television is 30% . The store places the television on sale at a discount of 20% off the marked-up cost.

**B** What is the cost of the television at this store when it is on sale? Show your work. Explain why the percent profit that the store earns from the sale of the television is **not** equal to 10% of the original cost. As part of the explanation, determine the percent profit that the store earns from the sale of the television.

**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

<b>Part A:</b>	score 1.0 point	correct answer with correct and complete work or explanation
	<b>OR</b>	
	score 0.5 point	correct answer with partially correct work or incomplete explanation
	<b>OR</b>	incorrect answer due to a calculation error (work must be shown)
	<b>OR</b>	correct answer with no work or explanation
<b>Part B:</b>	score 2.0 points	correct answers with correct work and complete explanation
		<b>OR</b>
	score 1.5 points	correct answers with correct work and incomplete explanation
		<b>OR</b>
	<b>OR</b>	one correct answer with correct work and complete explanation
		<b>OR</b>
	score 1.0 point	correct answers with partially correct work and incomplete explanation
		<b>OR</b>
	<b>OR</b>	one correct answer with partially correct work and incomplete explanation
		<b>OR</b>
score 0.5 point	incorrect answers due to a calculation error (work must be shown) with complete explanation	
	<b>OR</b>	
	correct answer with no work and incomplete explanation	
	<b>OR</b>	
<b>OR</b>	partially correct or incomplete explanation	
	<b>OR</b>	
<b>OR</b>	some correct procedure	

## Correct Answers

**Part A:** 25(%)

$$450 - 360 = 90$$

$$\frac{90}{360} = 0.25 = 25\%$$

**or equivalent work**

**OR**

### **Sample Explanation:**

The difference between the marked-up cost and the original cost is \$90 since  $450 - 360 = 90$  .

The percent markup is this difference divided by the original cost:  $\frac{90}{360} = 0.25$  or 25% .

**Part B:** (\$)374.40

$$\frac{130}{100} = \frac{x}{360}$$

$$100x = 46,800$$

$$x = 468$$

$$\frac{80}{100} = \frac{x}{468}$$

$$100x = 37,440$$

$$x = 374.40$$

**or equivalent work**

**AND**

### **Sample Explanation:**

The marked-up cost of the television is \$468.00, and the cost when it is on sale is 80% of the marked-up cost, or \$374.40 .

You cannot subtract the percent discount from the percent markup to determine the percent profit since the discount is applied after the markup. The actual percent profit is 4% because

$$\frac{1.3}{0.8} = 1.04, \text{ or } \frac{374.40}{360} = 1.04 .$$

**No 3-point responses**

### Instructional Materials Question 9

**A**

$$\begin{array}{r} 3450 \\ - 360 \\ \hline 90 \end{array}$$

$$\begin{array}{r} 360 \overline{) 1000} \\ \underline{- 720} \\ 280 \end{array}$$

25%

$$\begin{array}{r} 360 \\ + 360 \\ \hline 720 \\ \times 2 \quad 720 \\ \hline 1440 \\ + 360 \\ \hline 1800 \\ \times 3 \quad 1080 \\ + 360 \\ \hline 1440 \\ \times 4 \quad 1440 \\ + 360 \\ \hline 1800 \\ \times 5 \quad 1800 \end{array}$$

**B**

The store isn't getting a 10% profit. They are selling the TV for \$374.4. If they

$$\begin{array}{r} 360 \quad 360 \\ + 360 \\ \hline 396 \end{array}$$

want a 10% profit, they would have to sell it for \$396, so they are getting less than a 10% profit.

\$374.4

$$\begin{array}{r} 360 \\ 10\% \quad 36 \\ \hline 396 \end{array}$$

they would have to sell it for \$396, so they are getting less than a 10% profit.

$$\begin{array}{r} 374.4 \\ - 36 \\ \hline 338.4 \end{array}$$

$$\begin{array}{r} 360 \\ \times 1.1 \\ \hline 396 \end{array}$$

$$\begin{array}{r} 360 \\ + 108 \\ \hline 468 \end{array}$$

Score Point: 2

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

### Instructional Materials Question 9

**A**

~~100%~~      ~~400~~

$3450$   
 $360$   


---

 $90$

$360 \times .25 = 90$

$1800$   
 $1800$   


---

 $0$

$360$   
 $2$   


---

 $720$

$360$   
 $3$   


---

 $1080$

$360$   
 $4$   


---

 $1440$

$360$   
 $5$   


---

 $1800$

$.25%$

---

**B**

$\frac{10}{100} = \frac{15}{x}$        $\frac{20}{100} = \frac{x}{360}$

$7200 \times 100$   
 $720,000$

$72%$

$7200$   
 $100$   


---

 $0000$   
 $0000$   


---

 $72000$

$7200$   
 $20$   


---

 $7200$

$3744.1$

Score Point: 2

The response to Part A includes the correct answer with correct work (1.0). The response to Part B includes one correct answer with correct work (1.0).

### Instructional Materials Question 9

<p><b>A</b> The percent markup is 25% because you would - 300 from 450 = 90, and 90 is <math>\frac{1}{4}</math> of 360.</p>	$\begin{array}{r} \overline{)90} \\ 40 \overline{)1000} \\ \underline{40} \phantom{00} \\ 60 \phantom{0} \\ \underline{60} \phantom{0} \\ 0 \phantom{0} \end{array}$	$\begin{array}{r} 3450 \\ \underline{360} \\ 90 \end{array}$	$\begin{array}{r} 90 \\ \underline{4} \\ 360 \end{array}$	
<p><b>B</b> With the television on sale for 20% off it would be \$342.00.</p>	$\begin{array}{r} 20 \overline{)360} \\ \underline{20} \phantom{0} \\ 160 \end{array}$	$\begin{array}{r} 5 \\ \underline{360} \\ -18 \\ 342 \end{array}$		

**Score Point: 1**

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

Instructional Materials Question 9

$$\begin{array}{r}
 \text{A } 450 \\
 - 360 \\
 \hline
 90
 \end{array}
 \quad
 \begin{array}{r}
 5360 \\
 - 3120 \\
 \hline
 2240
 \end{array}
 \quad
 \begin{array}{r}
 360 \\
 + 32 \\
 \hline
 392
 \end{array}$$

90%

The store increases the cost of the television by 90%

$$\begin{array}{r}
 \text{B } 360 \\
 \times 1.3 \\
 \hline
 106.8
 \end{array}
 \quad
 \begin{array}{r}
 360 \\
 + 108 \\
 \hline
 468
 \end{array}
 \quad
 \begin{array}{r}
 468 \\
 \times 2 \\
 \hline
 936
 \end{array}
 \quad
 \begin{array}{r}
 3468.00 \\
 + 93.60 \\
 \hline
 374.40
 \end{array}$$

The price is \$374.40

$$\begin{array}{r}
 360 \\
 + 36 \\
 \hline
 396
 \end{array}$$

They are not equal because of the 30% increase price on the tv

Score Point: 1

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



**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.NS.A1a**

**10** Which situation involves opposite quantities that combine to make 0 ?

- A** Natalie had \$10 . Natalie’s brother gave her an additional \$10 .
- B** The temperature was  $10^{\circ}\text{F}$  on Monday afternoon. By Monday evening, the temperature had decreased by  $10^{\circ}\text{F}$ .
- C** The grass was 10 inches high. After the grass was mowed, the grass was 1 inch high.
- D** Joe threw a ball 10 feet into the air. The ball got stuck on the branch of a tree 10 feet above the ground.

**Scoring Notes:**

**Rationale A:** thinks addition involves opposite values

**Rationale B:** correct

**Rationale C:** involves subtraction but not opposite values

**Rationale D:** thinks repeated value indicates opposite values

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.NS.A1b**

**11**

Which of these situations could be modeled by the expression  $-4 - 3$  ? Select **all** that apply.

- A** John has 4 marbles. Sue takes 3 marbles from him.
- B** Mark owes his friend \$4 . Mark borrows an additional \$3 from his friend.
- C** The temperature is  $-4^{\circ}\text{F}$ . The temperature decreases an additional  $3^{\circ}\text{F}$ .
- D** Greg digs a hole 4 feet deep. Greg fills 3 feet of the hole with cement.
- E** Ally is on the 4th floor of a building. Ally descends 3 floors in an elevator.

**Scoring Notes:**

**Correct answers:** B, C

**Rationale A:** modeled by  $4 - 3$

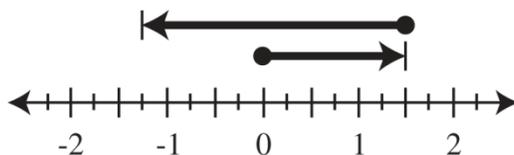
**Rationale D:** modeled by  $-4 + 3$

**Rationale E:** modeled by  $4 - 3$

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.NS.A1c**

**12**

A number line is shown below. The arrows above the number line model the addition and subtraction of two numbers.



Write **two** expressions that describe the addition and subtraction of the two numbers modeled by the arrows above the number line. Explain why the two expressions are equivalent.

Write your response on the grid below.

**Scoring Notes:**

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

- correct two expressions that describe the addition and subtraction of the two numbers modeled by the arrows above the number line,  $1.5 - 2.75$  and  $1.5 + (-2.75)$

**AND**

- explanation indicating why the two expressions are equivalent

For example,

- Evaluating either expression involves moving 1.5 units from zero in the positive direction, and then moving 2.75 units in the negative direction.

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

- correct two expressions that describe the addition and subtraction of the two numbers modeled by the arrows above the number line,  $1.5 - 2.75$  and  $1.5 + (-2.75)$

**OR**

- some explanation indicating why the two expressions are equivalent

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 7 Mathematics**  
**NVACS: M\_7.NS.A1d**

**13**

Which of these expressions are equivalent to  $0.7 - 1.1 - 2.5 + 3.2$  ? Select **all** that apply.

**A**  $0.7 - (1.1 - 2.5) + 3.2$

**B**  $0.7 - (1.1 - 2.5) - 3.2$

**C**  $(0.7 - 1.1 - 2.5) + 3.2$

**D**  $0.7 + (-1.1 - 2.5 - 3.2)$

**E**  $(0.7 - 1.1) - (2.5 + 3.2)$

**F**  $(0.7 - 1.1) - (2.5 - 3.2)$

**Scoring Notes:**

**Correct answers:** C, F

**Rationale A:** does not distribute negatives properly

**Rationale B:** does not distribute negatives properly

**Rationale D:** does not distribute negatives properly

**Rationale E:** does not distribute negatives properly

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.NS.A2b**

**14**

A baker has 18 cups of flour. For each cake he makes, the baker needs  $1\frac{3}{4}$  cups of flour. The baker only makes whole cakes and does not use the flour for anything other than the cakes. What is the **greatest** number of whole cakes the baker can make, and what is the number of cups of flour remaining? Write the answers in the blanks below.

\_\_\_\_\_ whole cakes

\_\_\_\_\_ cup(s) of flour  
remaining

**Scoring Notes:**

10 (whole cakes)

$\frac{1}{2}$  (cup of flour remaining)

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.NS.A2c**

**15**

Which of these expressions are equivalent to 1 ? Select **all** that apply.

**A**  $\left(\frac{2}{3}\right)\left(\frac{3}{5}\right)\left(\frac{10}{4}\right)$

**B**  $\left(\frac{7}{16}\right) \div \left(\frac{8}{3}\right) \div \left(\frac{6}{7}\right)$

**C**  $\left(\frac{5}{7}\right)\left(\frac{8}{3}\right)\left(\frac{13}{21}\right)$

**D**  $\left(-\frac{1}{2}\right) \div \left(\frac{3}{8}\right)\left(-\frac{4}{3}\right)$

**E**  $\left(\frac{2}{9}\right) \div \left(-\frac{4}{6}\right) \div \left(-\frac{5}{15}\right)$

**F**  $\left(\frac{3}{7}\right)\left(\frac{8}{9}\right) \div \left(\frac{8}{21}\right)$

**Scoring Notes:**

**Correct answers:** A, E, F

**Rationale B:** treats division as multiplication

**Rationale C:** adds 5 and 8, multiplies 3 and 7, and gets  $\frac{13}{21}$ ; since this equals 3rd fraction, thinks the whole expression is 1

**Rationale D:** inverts both  $\frac{3}{8}$  and  $-\frac{4}{3}$ , multiplies, and then multiplies by  $-\frac{1}{2}$

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.NS.A3**

**16** Simplify:

$$\frac{-\frac{3}{5} + \frac{1}{4}}{\frac{3}{8} - \frac{2}{5}}$$

A  $-\frac{2}{3}$

B  $-\frac{2}{11}$

C 6

D 14

**Scoring Notes:**

**Rationale A:** adds/subtracts numerators and denominators within given numerator and denominator:

$$\frac{\left(\frac{-2}{9}\right)}{\left(\frac{1}{3}\right)} = -\frac{2}{3}$$

**Rationale B:** “cancels” 3s:  $\frac{\left(-\frac{1}{5} + \frac{1}{4}\right)}{\left(\frac{1}{8} - \frac{2}{5}\right)}$

**Rationale C:** adds/subtracts numerators and denominators, and applies negative sign in  $-\frac{3}{5}$  to both numerator

and denominator:  $\frac{\left(\frac{-2}{-1}\right)}{\left(\frac{1}{3}\right)}$

**Rationale D:** correct

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.NS.A3**

**17** Valerie makes aprons and sells them at a craft fair. The sales price of each apron is the cost to make the apron plus a profit.

- The cost of materials to make all the aprons is \$30.00 .
- Using all the materials, she makes 25 aprons.
- She spends 1.6 hours making each apron.
- The sales price of each apron is \$8.00 .

Which statements about the aprons Valerie makes and sells are true? Select **all** that apply.

- A** She spends a total of 40 hours making all the aprons.
- B** The cost of materials to make each apron is \$3.75 .
- C** The total amount of the profit she earns from selling all the aprons is \$200.00 .
- D** She earns a profit of \$4.25 per hour making the aprons.

**Scoring Notes:**

**Correct answers:** A, D

**Rationale B:** divides cost of materials by sales price

**Rationale C:** does not deduct cost of materials

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.EE.A1**

**18**

Look at the expressions below. Are the expressions equivalent to  $6(5 + 2.5x) - 4(2.5 + 3x)$  ?

Select yes or no for **each** expression.

**A**  $20 + 3x$                        Yes       No

**B**  $20 + 5.5x$                        Yes       No

**C**  $3(10 - 4x) + 5(3x - 2)$        Yes       No

**D**  $15(2 + x) - 2(5 + 6x)$        Yes       No

**Scoring Notes:**

**Yes:** A, C, D

**No:** B

**Rationale B:** does not distribute to the second term in the parentheses

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.EE.A2**

**19**

Information about two items Amy purchased is shown in the list below.

- The original cost of the first item is  $x$  dollars.
- The original cost of the second item is  $y$  dollars.
- Amy purchased the first item for its original cost and the second item for 20% less than its original cost.

The total cost, in dollars, of the two items is described by the expression below.

$$x + y - (0.2y)$$

Which expression could also be used to describe the total cost of the two items Amy purchased?

- A  $0.8xy$
- B  $x + 0.8y$
- C  $1.8xy$
- D  $x + 5y$

**Scoring Notes:**

**Rationale A:** multiplies terms instead of adding

**Rationale B:** correct

**Rationale C:** combines unlike terms and coefficients

**Rationale D:** divides 1 by 0.2 instead of subtracting when finding coefficient of  $y$

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.EE.B3**

**20** Working together, Carson and Jayden planted 81 seedlings in a new community park. Carson planted 3 more than 2 times the number of seedlings Jayden planted.

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

Jayden planted  seedlings and Carson planted  seedlings.

Option 1

Option 2

Option 1
25
26
28
29

Option 2
52
53
55
56

**Scoring Notes:**

**Correct answers:**

Option 1: 26

Option 2: 55

**Rationales:**

Option 1: 25

Option 2: 53

$2(25) + 3 = 53$ , but  $25 + 53 \neq 81$

Option 1: 28

Option 2: 56

$2(28) = 56$ , doesn't add 3

Option 1: 29

Option 2: 52

$2(29) - 3 = 52$ ,  $29 + 52 = 81$

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.EE.B3; M\_7.RP.A3**

**21**

Faith, Garrett, and Miguel are classmates who worked in the computer lab on individual class projects last week. Their teacher asked each of the students to estimate how much time they had spent working on the computers.

- Faith said, “I spent  $4\frac{1}{2}$  hours working on the computers.”
- Garrett said, “I know I worked for 3 hours on the computers.”
- Miguel said, “I worked for  $3\frac{1}{4}$  hours on the computers.”

**A** The teacher checked the computer logs in the lab and found the actual amount of time each student spent working on the computers.

- Faith spent 4.25 hours working on the computers.
- Garrett spent 2.75 hours working on the computers.
- Miguel spent 3.00 hours working on the computers.

Which student made the **least** percent error in estimating his or her time spent working on the computers? Show your work or explain your thinking.

**B** Jocelyn is another student in the same class. The computer logs showed that Jocelyn spent 3.75 hours working on the computers. Jocelyn also gave the teacher an estimate that was longer than the actual time she had worked on the computer, but her estimate had a percent error that was **less** than the percent error for each of Faith, Garrett, and Miguel. Explain why Jocelyn’s estimate must have been **less** than 4 hours. Show your work.

**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

<b>Part A:</b>	score 1.5 points	correct answer with correct and complete work or explanation
	<b>OR</b>	
	score 1.0 point	correct answer with partially correct work or incomplete explanation
	<b>OR</b>	incorrect answer due to a calculation error (work must be shown)
<b>OR</b>		
	score 0.5 point	some correct procedure
	<b>OR</b>	
		partially correct or incomplete explanation
<b>Part B:</b>	score 1.5 points	correct and complete explanation with correct work
	<b>OR</b>	
	score 1.0 point	partially correct or incomplete explanation with work
	<b>OR</b>	
score 0.5 point	partially correct or incomplete explanation	
	<b>OR</b>	some correct procedure

## Correct Answers

**Part A:** Faith made the least percent error.

$$\text{Faith's percent error is } \frac{4\frac{1}{2} - 4.25}{4.25} = \frac{0.25}{4.25} .$$

$$\text{Garrett's percent error is } \frac{3 - 2.75}{2.75} = \frac{0.25}{2.75} .$$

$$\text{Miguel's percent error is } \frac{3\frac{1}{4} - 3}{3} = \frac{0.25}{3} .$$

**or equivalent work**

**OR**

**Sample Explanation:**

Faith, Garrett, and Miguel each overestimated the time they worked by 0.25 hour. Since Faith worked the greatest amount of time, she has the least percent error.

**Part B:** Accept all correct and complete explanations.

**Sample Explanation:**

Jocelyn's percent error must be less than  $\frac{1}{17}$ , or about 5.9% . The greatest Jocelyn's estimate, in hours, could be is  $3.75 + 0.059 \bullet 3.75$  , or about 3.97, which is less than 4 .

**No 3-point responses**  
**No 2-point responses**

### Instructional Materials Question 21

<b>A</b>	$4\frac{1}{2} = 4.50$		
	Faith 4.25	(1.5)	Faith because she had the light number so she 1.25 25 was his because of it
	Garrett 3.00		
	2.75		
	(25)		
	Miguel $3\frac{1}{4} = 3.25$		
	3.00		
	(25)		
<b>B</b>			

**Score Point: 1**

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

Instructional Materials Question 21

**A**

Faith  
 $4 \frac{1}{2}$  hrs =  $4.5$   
 Estimate = 4.5  
 Actual hrs. = 4.25

Miguel  
 $3 \frac{1}{4}$   
 Estimate = 3.25  
 Actual hrs = 3.00

Garrett 3 hrs  
 Estimate = 3 hrs  
 Actual hrs. = 2.75

Miguel = .25  
 Garrett = .25  
 Faith = .25

Faith had the least percent error in estimating his or her time working on the computer.

**B**

Jocelyn  
 3.75

Score Point: 1

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

### Instructional Materials Question 21

**A** All the students made the least percent error. They were all the same amount off. They were all 0.25 off

$$\text{Faith: } 4\frac{1}{2} = 4.50$$

$$\text{Faith: } 4.25$$

$$\text{Garrett: } 3 = 3.00$$

$$\text{Garrett: } 2.75$$

$$\text{Miguel: } 3\frac{1}{4} = 3.25$$

$$\text{Miguel: } 3.00$$

Estimated ↑↑

Actual ↑↑

$$\text{Faith: } 4.50 - 4.25 = 0.25$$

$$\text{Garrett: } 3.00 - 2.75 = 0.25$$

$$\text{Miguel: } 3.25 - 3.00 = 0.25$$

**B** Jocelyn's estimate must have been less than 4 hours because she didn't spend so long on the computer.

**Score Point: 1**

The response to Part A includes some correct procedure (0.5). The incorrect explanation in Part A represents a common error in student work. The response to Part B is incorrect (0).

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.EE.B4a**

**22**

An isosceles triangle has a base and two congruent sides. The perimeter of the triangle is 18.3 cm. The length of the base of the triangle is 7.3 cm. Using  $x$  to represent the length, in centimeters, of one of the congruent sides of the triangle, which equation can be used to determine the length of that side?

A  $2(7.3) + x = 18.3$

B  $2x + 18.3 = 7.3$

C  $18.3 = 2x - 7.3$

D  $18.3 - 2x = 7.3$

**Scoring Notes:**

**Rationale A:** multiplies length of base by 2 instead of multiplying length of side by 2

**Rationale B:** reverses perimeter and length of base

**Rationale C:** subtracts length of base instead of adding

**Rationale D:** correct

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.EE.B4b**

**23**

There are 7,000 fans who are season ticket holders and attend every game a sports team plays. Research shows that for every television commercial about the team that is aired, 100 additional fans will attend the next game.

Write an inequality in the blank below to describe the number of television commercials ( $x$ ) that should be aired to have **at least** 10,000 fans at the next game.

---

What is the least number of television commercials that should be aired to have **more than** 10,000 fans at the next game? Write the answer in the blank below.

---

**Scoring Notes:**

$10000 \leq 100x + 7000$  or equivalent

31

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.G.A1**

**24**

A floor plan for a new house is created using the scale 0.25 inch : 1 foot. The owner of the house wants to place a 7-foot-long couch along a wall. This wall measures 1.5 inches on the floor plan. Which statement **best** describes whether the couch will fit along the wall?

- A The couch will fit along the wall since  $1.5 < 7$ .
- B The couch will fit along the wall since  $6 < 7$ .
- C The couch will not fit along the wall since  $6 < 7$ .
- D The couch will not fit along the wall since  $1.5 < 42$ .

**Scoring Notes:**

**Rationale A:** compares a scale length with an actual length

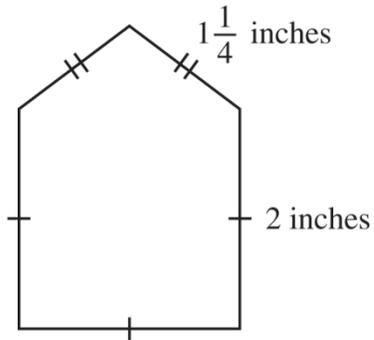
**Rationale B:** swaps lengths of wall and couch

**Rationale C:** correct

**Rationale D:** multiplies actual length (instead of scale length) by 6

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.G.A1**

**25** A scale drawing of a window in the shape of a pentagon is shown below.



Scale
$\frac{1}{2}$ inch : 1 foot

What is the perimeter of the actual window?  
Write the answer in the blank below.

\_\_\_\_\_ feet

**Scoring Notes:**

17 (feet)

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.G.A2**

**26**

Draw and label a triangle in which one angle measures  $90^\circ$  and two sides measure 3 cm and 5 cm.

Determine whether only one unique triangle, exactly two unique triangles, or more than two unique triangles can have these measurements.

Write your response on the grid below.

**Scoring Notes:**

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

- accurate drawing of a right triangle with sides 3 cm, 4 cm, and 5 cm, with sides labeled 3 cm and 5 cm, and right angle marked
- OR**
- accurate drawing of a right triangle with sides 3 cm, 5 cm, and approximately 5.83 cm, with sides labeled 3 cm and 5 cm, and right angle marked
- AND**
- correctly identifying how many triangles can have these measurements, exactly two triangles

For example,

- Student would draw accurately a right triangle with sides 3 cm, 4 cm, and 5 cm. Sides should be labeled 3 cm and 5 cm, and right angle should be marked. (Exact third side length does not need to be determined.)
- OR**
- Student would draw accurately a right triangle with sides 3 cm, 5 cm, and approximately 5.83 cm. Sides should be labeled 3 cm and 5 cm, and right angle should be marked. (Exact third side length does not need to be determined.)
- AND**
- There are exactly two such triangles.

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

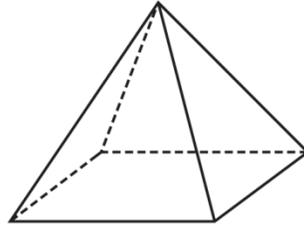
- accurate drawing of a right triangle with sides 3 cm, 4 cm, and 5 cm, with sides labeled 3 cm and 5 cm, and right angle marked
- OR**
- accurate drawing of a right triangle with sides 3 cm, 5 cm, and approximately 5.83 cm, with sides labeled 3 cm and 5 cm, and right angle marked
- OR**
- correctly identifying how many triangles can have these measurements, exactly two triangles

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 7 Mathematics**  
**NVACS: M\_7.G.A3**

**27**

When a plane slices through the square pyramid pictured below, the result is a two-dimensional shape.



Which of these two-dimensional shapes could be the result of the slice? Select **all** that apply.

- A** a square
- B** an isosceles triangle
- C** a rectangle that is not a square
- D** a quadrilateral with exactly one pair of parallel sides

**Scoring Notes:**

**Correct answers:** A, B, D

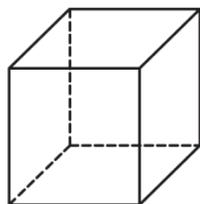
**Rationale C:** perspective makes base look non-square

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.G.A3**

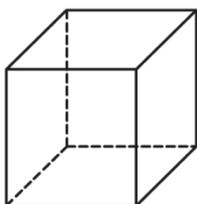
**28**

When a cube is sliced by a plane, a two-dimensional shape is formed.

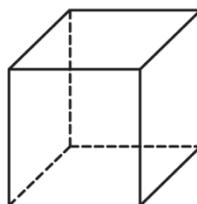
- A Show how a plane could slice each of the four cubes to form the two-dimensional shape listed below it. On the next page, shade each two-dimensional shape that is formed by the plane slicing the cube.



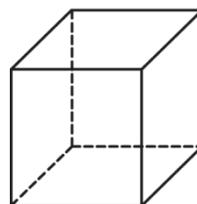
square



rectangle



triangle



trapezoid

- B Explain why, when a cube is sliced by a plane, the two-dimensional shape formed will **never** be a right triangle.

**Write your response on the grid on the next page.**

**Scoring Notes:**

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

**Score Points**

**Part A:** score 2.0 points correct shading on each of the 4 shapes

**OR**

score 1.5 points correct shading on 3 of the 4 shapes

**OR**

score 1.0 point correct shading on 2 of the 4 shapes

**OR**

score 0.5 point correct shading on 1 of the 4 shapes

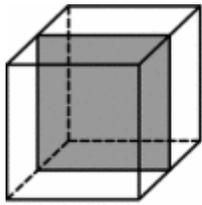
**Part B:** score 1.0 point correct and complete explanation

**OR**

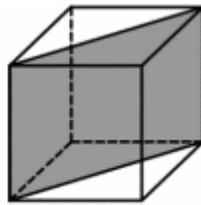
score 0.5 point partially correct or incomplete explanation

## Correct Answers

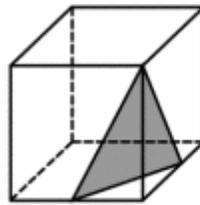
**Part A:** Sample drawings:



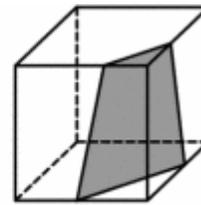
square



rectangle



triangle



trapezoid

**Part B:** Accept all correct and complete explanations.

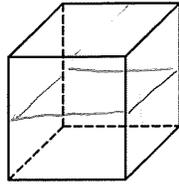
### Sample Explanation:

The two-dimensional shape formed by the plane slicing the cube can be a triangle, but never a right triangle. The only way to get a right angle in a two-dimensional figure is if the plane slices the cube perpendicularly to a face. And any plane slice that is perpendicular to a face would be a quadrilateral.

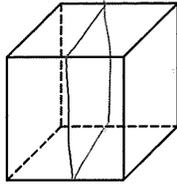
**No 3-point responses**

### Instructional Materials Question 28

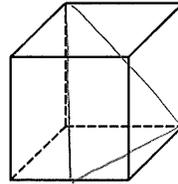
A



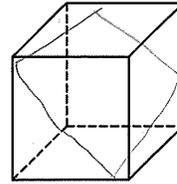
square



rectangle



triangle



trapezoid

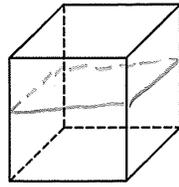
B When a cube is sliced by a plane it will never be a right triangle because its not possible with one-

Score Point: 2

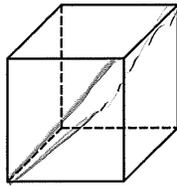
The response to Part A includes a correct drawing for each of the 4 shapes (2.0). The response to Part B is incorrect (0).

### Instructional Materials Question 28

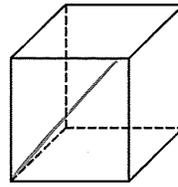
A



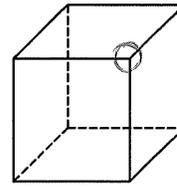
square



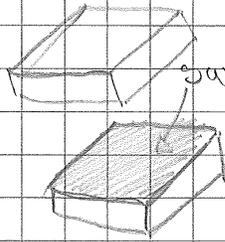
rectangle



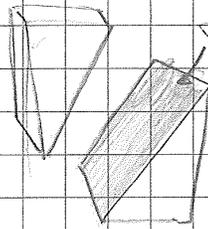
triangle



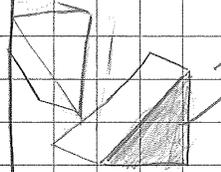
trapezoid



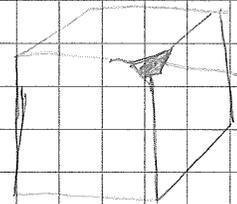
Square



Rectangle



Triangle



Trapezoid

Square

Rectangle

Triangle

Trapezoid

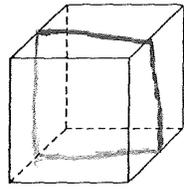
B The only way to get a 90° triangle is with a corner, and that is not a 2 dimensional shape.

Score Point: 1

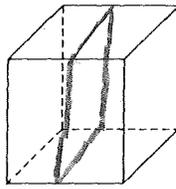
The response to Part A includes a correct drawing for 2 of the 4 shapes (1.0). The response to Part B is incorrect (0).

### Instructional Materials Question 28

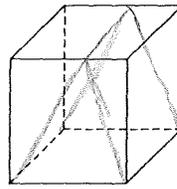
A



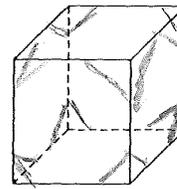
square



rectangle



triangle



trapezoid

B

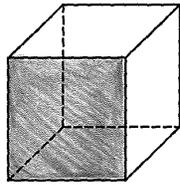
Due too the fact a Plane make a  
straight line and never misses.

Score Point: 1

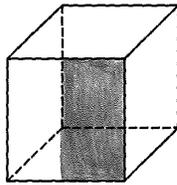
The response to Part A includes a correct drawing for 2 of the 4 shapes (1.0). The response to Part B is incorrect (0).

### Instructional Materials Question 28

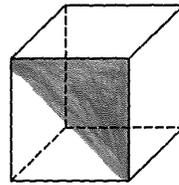
A



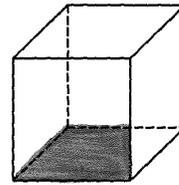
square



rectangle



triangle



trapezoid

B When a cube is sliced by a plane, the two-dimensional shape formed will never be a right triangle.

Score Point: 0

The response to Part A is incorrect, and represents a common error/misconception in student work (0). The response to Part B is incorrect (0).

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.G.B4**

**29**

A circular stage has an area of  $A$  square meters. The border of the stage is a fence with a length of  $C$  meters. Which equation describes the relationship between  $A$  and  $C$  ?

**A**  $C = 2A$

**B**  $C = 4A$

**C**  $C = \frac{2A}{r}$

**D**  $C = \frac{Ar}{2}$

**Scoring Notes:**

**Rationale A:** did not square  $r$  in formula for  $A$

**Rationale B:** treats  $C$  and  $A$  as if perimeter and area of a square

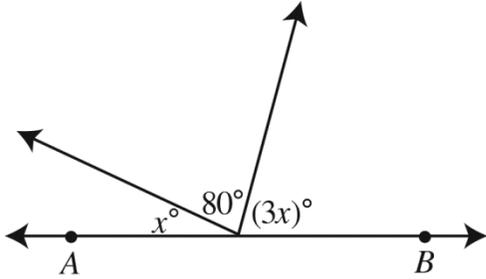
**Rationale C:** correct

**Rationale D:** swaps 2 and  $r$  in numerator and denominator

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.G.B5**

**30**

The figure below shows line  $AB$ .



What is the value of  $3x$ ? Write the answer in the blank below.

\_\_\_\_\_

**Scoring Notes:**

75

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.G.B5**

**31**

Two lines and a ray intersect at the same point. Some information about the 5 distinct angles formed is listed below.

- The angle measuring  $p^\circ$  and the angle measuring  $q^\circ$  are supplementary and adjacent.
- The angle measuring  $q^\circ$  and the angle measuring  $r^\circ$  are complementary and adjacent.
- The angle measuring  $q^\circ$  and the angle measuring  $s^\circ$  are vertical angles.
- The angle measuring  $t^\circ$  is adjacent to the angle measuring  $r^\circ$ .

Which equations show relationships that **must** be true among the 5 distinct angle measures? Select **all** that apply.

A  $p^\circ = 2(s^\circ)$

B  $p^\circ + s^\circ = 180^\circ$

C  $q^\circ + s^\circ - r^\circ = 90^\circ$

D  $r^\circ + t^\circ = p^\circ$

E  $r^\circ + s^\circ + t = 180^\circ$

**Scoring Notes:**

**Correct answers:** B, D, E

**Rationale A:** could be true if  $s$  measures  $60^\circ$ , but not a given

**Rationale C:** could be true if  $q$  and  $s$  each measure  $45^\circ$ , but not a given

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.G.B6**

**32**

Four 3-dimensional objects are described below.

- Object A is a cube with side lengths of 5 units.
- Object B is a right triangular prism with a height of 15 units and triangular bases with side lengths of 3 units, 4 units, and 5 units.
- Object C is a right octagonal prism with a height of 3 units and a base area of 50 square units.
- Object D is a right rectangular prism with a height of 8 units, a width of 6 units, and a length of 4 units.

Write the letter of each object in the blanks below to show the order of the 3-dimensional objects from **greatest** volume to **least** volume.

\_\_\_\_\_

**Scoring Notes:**

D, C, A, B

A:  $5^3 = 125$

B:  $15(0.5 \cdot 3 \cdot 4) = 90$

C:  $3 \cdot 50 = 150$

D:  $8 \cdot 6 \cdot 4 = 192$

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.G.B6**

**33**

A patio in the shape of a rectangular prism is being built. The patio is 6 feet long, 3 feet wide, and 3 inches deep. The patio requires 24 bags of cement.

**A** How many bags are needed for each cubic foot of the patio? Show your work or explain your thinking.

A second patio will be built. The second patio has a length 1.5 times the length of the first one, a width  $\frac{2}{3}$  of the width of the first one, and a depth 2 times the depth of the first one.

**B** Determine the volume of the second patio and the number of bags of cement needed for the second patio. Show your work or explain your thinking.

**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

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

## Correct Answers

**Part A:**  $5\frac{1}{3}$  (bags)

$$6 \cdot 3 \cdot \frac{3}{12} = \frac{9}{2} = 4.5$$

$$\frac{24}{4.5} = \frac{48}{9} = 5\frac{1}{3}$$

**or equivalent work**

**OR**

**Sample Explanation:**

The volume of the patio is  $6 \cdot 3 \cdot \frac{3}{12} = \frac{9}{2} = 4.5$  cubic feet. The patio requires 24 bags of cement,

so  $\frac{24}{4.5} = \frac{48}{9} = 5\frac{1}{3}$  bags are needed for each cubic foot of the patio.

**Part B:** 48 (bags)

$$(1.5 \cdot 6) \cdot \left(\frac{2}{3} \cdot 3\right) \cdot \left(2 \cdot \frac{3}{12}\right) = 9$$

$$9 \cdot \frac{48}{9} = 48$$

**or equivalent work**

**OR**

**Sample Explanation:**

The second patio has a volume equal to  $(1.5 \cdot 6) \cdot \left(\frac{2}{3} \cdot 3\right) \cdot \left(2 \cdot \frac{3}{12}\right) = 9$  cubic feet. The second

patio requires  $9 \cdot \frac{48}{9} = 48$  bags of cement.

**No 3-point responses**  
**No 2-point responses**

Instructional Materials Question 33

A 6 ft long, 3 feet wide, 3 inches deep.

54 bags are required.

$$6 \cdot 3 \cdot 3 = 54$$

$$\begin{array}{r} 18 \\ \times 3 \\ \hline 54 \end{array}$$

B

1.5 times the length,  $\frac{2}{3}$  width, 2 times depth

$$\begin{array}{r} 1.5 \\ \times 6 \text{ ft} \\ \hline 9.0 \text{ ft} \end{array}$$

9 ft long  
2 ft long  
6 inches

$$\begin{array}{r} 30 \\ -18 \\ \hline 20 \end{array}$$

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

$$\begin{array}{r} 18 \\ \times 6 \\ \hline 108 \end{array}$$

9.2 · 6  
18 · 6

The 2nd patio's volume is 9 ft long, 2 ft wide, and 6 inches deep. You need 108 bags of cement.

Score Point: 1

The response to Part A is incorrect and represents a common error in student work (0). The response to Part B includes some correct procedure (0.5).

Instructional Materials Question 33

A

$$\begin{array}{r} 24 \\ \times 3 \\ \hline 72 \end{array}$$

72 bags (because it 6 feet long)  
and 3 feet wide

---

<p>① Length</p> $\begin{array}{r} 3 \\ \times 1.5 \\ \hline 4.5 \end{array}$ <p>90 ft tall</p>	<p>Width</p> $\begin{array}{r} 300 \\ \times 3 \\ \hline 900 \\ \times 10 \\ \hline 9000 \\ \times 100 \\ \hline 900000 \end{array}$ <p>1.98</p>	<p>Depth</p> $\begin{array}{r} \times 3 \\ \hline 6 \text{ in} \end{array}$
--	--	---

All together the sand pit is 90 ft tall, 1.98 wide, & 6 inches deep.

B

$$\begin{array}{r} 24 \\ \times 2 \\ \hline 48 \end{array}$$

It will need 48 bags

Score Point: 1

The response to Part A is incorrect (0). The response to Part B includes some correct procedure, however no credit awarded for the correct answer obtained for the wrong reason (0.5).

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.SP.A1; M\_7.SP.A2**

**34**

Paige and Alexia survey students at their middle school to determine the average number of apps that students have on their smart phones and tablets.

- A** Paige interviews 24 students by selecting every 12th student during lunch, while Alexia interviews all 24 students in her math class. Explain which survey is more likely to accurately predict the average number of apps on a student's smart phone or tablet.
- B** The answers of the 24 students from the survey that is more likely to accurately predict are shown below.

**6 7 11 12 14 27 25 9 12 15 18 21**  
**15 6 13 22 24 17 11 4 19 10 25 20**

Make a prediction about the average number of apps on a smart phone or tablet that belongs to a student at this middle school. Show your work or explain your thinking.

**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

<b>Part A:</b>	score 1.0 point	correct and complete explanation
	<b>OR</b> score 0.5 point	partially correct or incomplete explanation
<b>Part B:</b>	score 2.0 points	correct answer (answer may vary) with correct and complete work or explanation
	<b>OR</b> score 1.5 points	correct answer (answer may vary) with partially correct work or incomplete explanation
	<b>OR</b> score 1.0 point	correct answer with no explanation
	<b>OR</b>	incorrect answer due to a calculation error (work must be shown) with explanation
	<b>OR</b> score 0.5 point	partially correct or incomplete explanation
	<b>OR</b>	some correct procedure

## Correct Answers

**Part A:** Accept all correct and complete explanations.

**Sample Explanation:**

Paige's survey is better because it uses a more representative sample. Alexia's survey uses a biased sample since she only asked students in one class.

**Part B:** Answers may vary. Accept a range of answers from 14–16. Either the mean or the median is acceptable since the distribution is fairly symmetrical.

$$\frac{6+7+11+12+14+27+25+9+12+15+18+21+15+6+13+22+24+17+11+4+19+10+25+20}{24} = 15.125$$

**or equivalent work**

**OR**

**Sample Explanation:**

15, because the mean is 15.125 apps.

**OR**

14, because the median is 14.5 apps.

**OR**

15, because looking at the sample data distribution leads to seeing that the data are symmetrical about 14–15.

**No 3-point responses**



Instructional Materials Question 34

A I think the most accurate survey is pages survey because she is randomly picking people. But Alexia is just interviewing all the people in her class.

B I believe the average number of apps on a smart phone is about 13. I found my answer by putting the numbers in order and crossing them out. That theory is called finding the Median.

~~4 6 7 9 10 11 12 12 13 14 15 15 17~~  
18 20 21 22 24 25 27

Score Point: 2

The response to Part A includes a correct and complete explanation (1.0). The response to Part B includes an incorrect answer (only 22 of 24 data points used) with complete explanation (1.0).

### Instructional Materials Question 34

A

I think Paige's and Alexio's surveys are both accurate. The number of apps a person has on their smartphone or tablet has nothing to do in which class they are being asked in. Where they are being asked and what apps they have on their smartphone and/or tablet have no correlation.

Same accuracy

B I think the Average is around 15. I think this because it is around the middle. The lowest number is 6 and the highest number is 25. 15 is 9 numbers away from 6 and 10 away from 25. It is very close to the middle therefore I think it is the Average.

15 Average

Score Point: 1

The response to Part A is incorrect (0). The response to Part B includes a correct answer with no valid explanation (1.0).

Instructional Materials Question 34

A

Patricia's survey will be more accurate because it will make it a non-biased survey. Alexis's interview is biased because it's only people in her math class.

B

My prediction is 6, 7, 11, 12, 14, 27, 25, 19, 12,  
15, 18, 21, 15, 6, 3, 22, 24, 17, 14,  
23 apps average. 4, 12, 10, 25, 20

My thinking is subtracting the most apps by the least apps.

$$\begin{array}{r} 27 \\ -4 \\ \hline 23 \end{array}$$

Score Point: 1

The response to Part A includes a correct and complete explanation (1.0). The response to Part B is incorrect (0).

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.SP.A2**

- 35** Customers at a new restaurant have four drink choices at breakfast. The restaurant randomly selects 50 breakfast customers on Monday and 50 breakfast customers on Tuesday and records their drink orders. The total numbers of orders for each type of drink are shown in the table below.

**Number of Drinks Ordered**

	Monday	Tuesday
Water	24	22
Coffee	38	34
Orange Juice	9	12
Hot Chocolate	5	6

The restaurant expects to have 2,000 breakfast customers each week. Based on the information in the table, which inferences about the expected drink orders at breakfast each week are **likely** true? Select **all** that apply.

- A** The restaurant expects to serve 3,000 drinks each week at breakfast.
- B** Slightly less than  $\frac{1}{3}$  of the drinks ordered at breakfast each week will be water.
- C** About 2,100 of the drinks ordered at breakfast each week will be coffee.
- D** Between 18% and 24% of the drinks ordered at breakfast each week will be orange juice.
- E** Out of every 75 drinks ordered at breakfast each week, about 5 or 6 of the drinks will be hot chocolate.

**Scoring Notes:**

**Correct answers:** A, B, E

**Rationale C:** estimates  $\frac{38}{50}$  or  $\frac{34}{50}$  as close to  $\frac{35}{50}$  or about 70%, and finds 70% of 3,000 instead of finding  $\frac{38}{76}$  and  $\frac{34}{74}$

**Rationale D:** uses number of customers instead of number of drinks ordered as denominator, so uses  $\frac{9}{50}$  or  $\frac{18}{100}$  and  $\frac{12}{100}$  or  $\frac{24}{100}$  to get 18% and 24%

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.SP.A2**

**36**

A student club is ordering T-shirts for each of the 2,000 students at a school. To determine how many small, medium, and large T-shirts to order, Jim and Eleanor each survey 50 students about their T-shirt sizes. The results of the surveys are shown in the table below.

**Results of T-Shirt Size Surveys**

	Small	Medium	Large
Jim	15	10	25
Eleanor	23	18	9

Based on the results, what is the **least** number of T-shirts in each size that the club should order, and what is the **greatest** number of T-shirts in each size that the club should order? Explain your thinking.

Write your response on the grid below.

## Scoring Notes:

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

- correct **least** number and **greatest** number of T-shirts in each size,  
from 600 to 920 small T-shirts should be ordered  
from 400 to 720 medium T-shirts should be ordered  
from 360 to 1,000 large T-shirts should be ordered  
**AND**
- explanation identifying how the **least** number and **greatest** number of T-shirts in each size were determined

For example,

- Each value in the table is the numerator in a fraction with a denominator of 50. When equivalent fractions are found with a denominator of 2,000, the numerators in those fractions represent the least and greatest numbers of T-shirts of each size that the club should order.

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

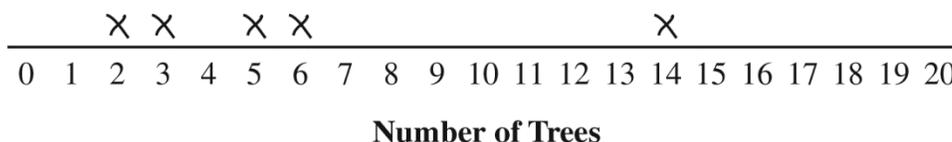
- correct **least** number and **greatest** number of T-shirts in each size,  
from 600 to 920 small T-shirts  
from 400 to 720 medium T-shirts  
from 360 to 1,000 large T-shirts  
**OR**
- correct **least** number and **greatest** number of T-shirts in two of the sizes, with some explanation identifying how the **least** number and **greatest** number of T-shirts in each size were determined

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

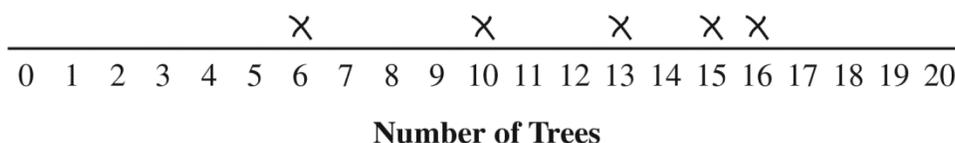
**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.SP.B3**

**37** During two weeks in the summer, a student group plants trees each weekday. The line plots below show data sets representing the numbers of trees planted.

**Trees Planted in First Week**



**Trees Planted in Second Week**



<b>Key</b>
x = 1 day

The mean absolute deviations of the data sets are the same. Select the **two** statements about the data shown in the line plots that are **most** likely to be true.

- A** The difference between the mean number of trees planted in each week is between 1 and 2 times the variability of the data sets.
- B** The mean number of trees planted in the second week is 2 times as great as the mean number of trees planted in the first week.
- C** The difference between the mean number of trees planted in each week is between 3 and 4 times the variability of the data sets.
- D** The mean number of trees planted in the first week is 2 greater than the mean number of trees planted in the second week.

**Scoring Notes:**

**Correct answers:** A, B

**Rationale C:** the mean absolute deviation for each week is 3.2

**Rationale D:** the range for the first week is 2 greater than for the second week

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.SP.C5**

**38** Each person attending a meeting is guaranteed to win either a hat or a T-shirt. Of the 540 people attending the meeting, 180 people will be randomly selected to win a hat. Which number represents the probability that a person not selected to win a hat **will** be selected to win a T-shirt?

A 0

B  $\frac{1}{3}$

C  $\frac{2}{3}$

D 1

**Scoring Notes:**

**Rationale A:** confuses impossible and certain

**Rationale B:** probability that randomly selected person wins a hat

**Rationale C:** probability that randomly selected person wins a T-shirt

**Rationale D:** correct

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.SP.C7a**

**39**

There are 10 houses in a complex, each with a unique street address. The last digits of the street addresses of the houses range from 0 through 9, with no last digit repeated.

Four events are described below. Write the letter of each event in the blanks below to show the events in order from **least** probability to **greatest** probability.

- A randomly selecting a house with a street address ending in a multiple of 3
- B randomly selecting a house with a street address ending in 5
- C randomly selecting a house with a street address ending in a number less than 2
- D randomly selecting a house with a street address ending in an odd number

**Scoring Notes:**

Correct answer: B, C, A, D

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.SP.C5**

**40** The probability of each of five events occurring is shown in the table below.

Event	Probability
A	$\frac{13}{1,000}$
B	$\frac{93}{100}$
C	$\frac{1}{2}$
D	$\frac{1}{5}$
E	$\frac{7}{12}$

Place check marks in the table below to indicate whether the probability of each event occurring is unlikely, neither unlikely nor likely, or likely.

Event	Unlikely	Neither Unlikely Nor Likely	Likely
A			
B			
C			
D			
E			

**Scoring Notes:**

<b>Event</b>	<b>Unlikely</b>	<b>Neither Unlikely Nor Likely</b>	<b>Likely</b>
A	✓		
B			✓
C		✓	
D	✓		
E		✓	

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.SP.C6**

**41**

Four classes collected pennies for a charity. Some of the pennies collected were wheat pennies (which were minted only between 1909 and 1958). The students in three of the classes recorded the number of wheat pennies collected and the total number of pennies collected by their class. The results are shown in the table below.

**Pennies Collected for Charity**

<b>Class</b>	<b>Number of Wheat Pennies Collected</b>	<b>Total Number of Pennies Collected</b>
Ms. Lee	2	810
Ms. Johnson	3	1,220
Mr. Gomez	4	1,570
Mrs. Griffith		2,380

Based on the information in the table, predict the number of wheat pennies the students in Mrs. Griffith's class **most** likely collected. Show your work and justify your procedure.

Write your response on the grid below.

## Scoring Notes:

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

- correct prediction of the number of wheat pennies most likely collected by Mrs. Griffith’s class, 6 (wheat pennies)  
**AND**
- correct work and explanation justifying the procedure used to make the prediction

For example,

- They most likely collected 6 wheat pennies. By combining the results for the first three classes, the probability of collecting a wheat penny was exactly  $\frac{9}{3600}$ , or 0.0025 . Also, for each of the three classes the probability of collecting a wheat penny was close to 0.0025 . Mrs. Griffith’s class collected approximately 2,400 pennies, so the number of wheat pennies,  $x$ , can be predicted using  $\frac{x}{2400} = 0.0025$  .
- **OR**  
They most likely collected 6 wheat pennies. 2,380 is the sum of the total number of pennies collected in Ms. Lee’s class and Mr. Gomez’s class, and 6 is the sum of the number of wheat pennies collected in those classes.  $\frac{2+4}{810+1570} = \frac{6}{2380}$

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

- correct prediction of the number of wheat pennies most likely collected by Mrs. Griffith’s class, 6 (wheat pennies)  
**OR**
- correct work with no explanation justifying the procedure used to make the prediction  
**OR**
- incorrect prediction due to a calculation error (work must be shown) with explanation justifying the procedure used to make the prediction

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 7 Mathematics**  
**NVACS: M\_7.SP.C7a; M\_7.SP.C6**

**42**

There are 10 students, boys and girls who are 12 years old or 13 years old, in a school club. At each meeting, the club's adviser randomly selects a student to take notes. The table below shows information about the student selected to take notes at each of the past 20 meetings for which all students were in attendance.

**Students Selected to Take Notes**

Meeting	Student	Meeting	Student
1	boy, 13 years old	11	girl, 12 years old
2	boy, 12 years old	12	boy, 12 years old
3	girl, 12 years old	13	girl, 12 years old
4	girl, 13 years old	14	boy, 12 years old
5	girl, 12 years old	15	girl, 12 years old
6	boy, 13 years old	16	girl, 13 years old
7	girl, 13 years old	17	girl, 12 years old
8	girl, 12 years old	18	boy, 12 years old
9	boy, 12 years old	19	girl, 12 years old
10	girl, 13 years old	20	boy, 12 years old

- A** Using the information in the table, predict the likely numbers of boys and girls of each age in the club. Explain your thinking.
- B** Based on your answer to **Part A**, determine the probability that the adviser randomly selects a boy to take notes at the next meeting for which all students are in attendance. Explain your thinking.

**Write your response on the grid on the next page.**

## Scoring Notes:

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

## Score Points

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

## Correct Answers

**Part A:** There are likely 3 boys who are 12 years old, 1 boy who is 13 years old, 4 girls who are 12 years old, and 2 girls who are 13 years old in the club.

**AND**

### Sample Explanation:

Based on the table, the probability that a boy who is 12 years old is selected is  $\frac{6}{20}$ . The probability that a boy who is 13 years old is selected is  $\frac{2}{20}$ . The probability that a girl who is 12 years old is selected is  $\frac{8}{20}$ . And the probability that a girl who is 13 years old is selected is  $\frac{4}{20}$ . Because there is information for 20 meetings, but there are only 10 students in the club, I divided each probability by 2. When the denominators are 10, the numerators are likely the number of students of each type in the club.

**Part B:**  $\frac{4}{10}$  (or equivalent)

**AND**

### Sample Explanation:

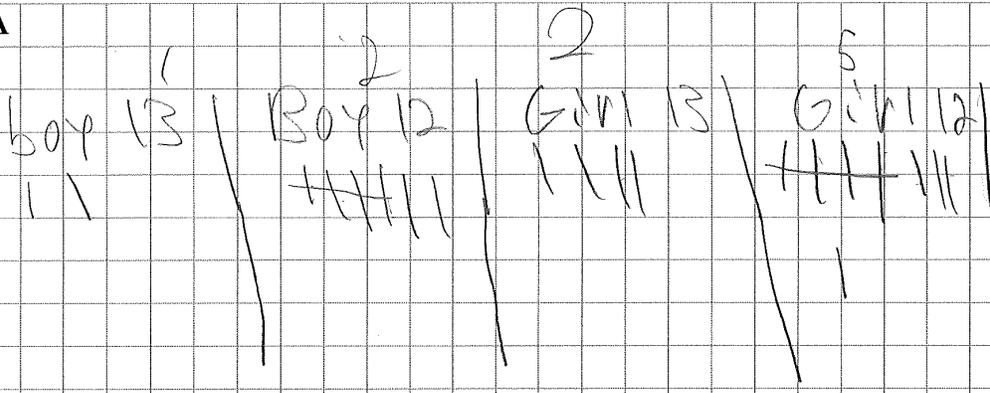
The probability that the adviser randomly selects a boy to take notes is equal to the number of boys divided by the total number of students. Since there are likely 3 boys who are 12 years old and 1 boy who is 13 years old, there are 4 boys in the club, out of a total of 10 students.

**No 3-point responses**



Instructional Materials Question 42

A



5 12 year old girls, 2 13 year old girls,  
2 12 year old boys, & 1 13 year old boy.

I conducted this by seeing as how the most pick are the 12 year old girls, then down from there.

B

7 girls 3 boy  $\frac{7}{10}$  girls  
 $\frac{3}{10}$  boy

there is a  $\frac{3}{10}$  probability that the adviser randomly selects a boy to take notes

Score Point: 2

The response to Part A includes some correct procedure (0.5). The response to Part B includes the correct answer (based on answer from Part A) with correct and complete explanation (1.5).

### Instructional Materials Question 42

A

Boys 13 - 1

Boys 12 - 3

Girls 13 - 2

Girls 12 - 4

B

Probably a 12 year old boy because there are 3 of them they're most likely to be picked. there is only 1 13 year old boy.

Score Point: 1

The response to Part A includes the correct answer with no explanation (0.5). The response to Part B includes some correct procedure (0.5).



**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.SP.C7b**

- 43** The arrow on a spinner with different-colored sections is spun 600 times. The table below shows the results of the spins.

**Results of 600 Spins**

Color	Frequency
blue	63
green	57
red	67
yellow	42
orange	315
black	56

Which statement about the fraction of the area of the spinner that is each color is **most** likely to be true?

- A** The blue, green, red, yellow, and black sections are each  $\frac{1}{10}$  of the area, and the orange section is  $\frac{1}{2}$  of the area.
- B** The blue, green, red, yellow, and black sections are each  $\frac{1}{6}$  of the area, and the orange section is  $\frac{5}{6}$  of the area.
- C** The blue, green, red, yellow, and black sections are each  $\frac{1}{5}$  of the area, and the orange section is  $\frac{1}{2}$  of the area.
- D** The blue, green, red, yellow, orange, and black sections are each  $\frac{1}{6}$  of the area.

**Scoring Notes:**

**Rationale A:** correct

**Rationale B:** thinks of orange being about 5 times the size of each other color

**Rationale C:** forgets that 5 other colors are only on half of the spinner

**Rationale D:** does not look at results, assumes sections are equal in size

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.SP.C8a**

**44** Karen places 4 cards in a bag. Each of the cards has the name of one of Karen's classmates written on it: Nell, Victor, Rick, and Shana. Karen randomly selects the 4 cards, one by one, and removes them from the bag.

A list of probabilities and four events are shown below. In the box next to each event, write the letter of the probability that represents that event. Some probabilities from the list may not be used.

**A**  $\frac{1}{24}$     **B**  $\frac{1}{16}$     **C**  $\frac{1}{12}$     **D**  $\frac{1}{6}$     **E**  $\frac{1}{3}$     **F**  $\frac{1}{2}$

- Karen selects the card for Nell first and the card for Victor second.
- Karen selects the cards for Nell and Victor as the first two cards.
- Karen selects the card for Nell before she selects the card for Victor.
- Karen selects the card for either Rick or Shana, but not both, between the cards for Nell and Victor.

**Scoring Notes:**

Correct answer: C, D, F, E

**Nevada Instructional Materials Phase III**  
**Grade 7 Mathematics**  
**NVACS: M\_7.SP.C8b; M\_7.SP.C8a**

**45**

John has two boxes of balls. All the balls in the boxes are identical except for their colors.

- In the first box, there is a red ball, a green ball, and a yellow ball.
- In the second box, there is a red ball, a white ball, and a black ball.

In an experiment, John randomly selects one ball from each box. Fill in the chart below to show all the possible outcomes of the experiment.


What is the probability that at **least** one ball John selects is red? Explain how the chart can be used to determine this probability.

Write your response on the grid below.

**Scoring Notes:**

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

- correct chart that shows all the possible outcomes of the experiment,

red, red	red, white	red, black
green, red	green, white	green, black
yellow, red	yellow, white	yellow, black

**AND**

- correct probability that at least one ball John selects is red,  $\frac{5}{9}$

**AND**

- explanation indicating how the chart can be used to determine the probability

For example,

- The probability is  $\frac{5}{9}$  that at least one ball John selects is red. This can be determined by counting the number of cells in the chart that contain the word “red,” and dividing that by the total number of cells.

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

- correct chart that shows all the possible outcomes of the experiment,

red, red	red, white	red, black
green, red	green, white	green, black
yellow, red	yellow, white	yellow, black

**OR**

- correct probability that at least one ball John selects is red,  $\frac{5}{9}$

**OR**

- some explanation indicating how the chart can be used to determine the probability

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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