



# INSTRUCTIONAL MATERIALS

for the Criterion Referenced Test



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## MATHEMATICS GRADE 7

**1** Multiply:

$$-1\frac{2}{63} \cdot \frac{3}{-5}$$

- A  $-\frac{13}{21}$
- B  $-\frac{2}{105}$
- C  $\frac{2}{105}$
- D  $\frac{13}{21}$

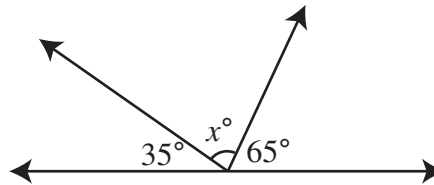
**2** The original price of a pair of shoes is  $p$  dollars. The expression below represents the sale price of the pair of shoes.

$$0.85p$$

Which statement about the sale price of the pair of shoes **must** be true?

- A The sale price is 15% less than the original price.
- B The sale price is 85% less than the original price.
- C The sale price is \$15 less than the original price.
- D The sale price is \$85 less than the original price.

**3** The figure below shows a horizontal line and two rays. The rays have a common endpoint that lies on the line.



Which equation could be used to determine the value of  $x$  ?

- A  $x = 65 - 35$
- B  $x = 65 + 35$
- C  $35 + x + 65 = 90$
- D  $35 + x + 65 = 180$

**4** Which list shows the lengths of three line segments that could **not** form a triangle?

- A 6 cm, 8 cm, 10 cm
- B 5 cm, 6 cm, 7 cm
- C 4 cm, 7 cm, 13 cm
- D 3 cm, 6 cm, 6 cm

- 5** The equation below can be used to determine the height ( $h$ ), in feet, of the wall that Isabel is painting.

$$48h - 6 = 426$$

What is the height of the wall?

- A  $8\frac{3}{4}$  feet
- B 9 feet
- C  $10\frac{1}{7}$  feet
- D 23 feet

- 6** Sharon has  $3\frac{3}{8}$  cups of soup. One serving of soup is  $\frac{1}{2}$  cup. How many servings of soup does Sharon have, and how many cups of soup are remaining?

- A 6 servings, with  $\frac{1}{4}$  cup remaining
- B 6 servings, with  $\frac{3}{8}$  cup remaining
- C 7 servings, with  $\frac{1}{4}$  cup remaining
- D 7 servings, with  $\frac{1}{2}$  cup remaining

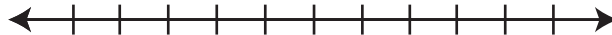
Write your answer to Question 7 on a separate sheet of paper. Be sure to answer Parts A and B.

**7**

Julie will choose either plumber Smith or plumber Brown to do a repair job. Plumber Smith charges \$40 per hour plus a flat fee of \$35 . He tells Julie that the total cost of her repair job will be less than \$215 .

- A** Write an inequality that can be used to determine all the possible numbers of hours ( $h$ ) plumber Smith can work for the total cost of the repair job to be less than \$215 .

Copy the line shown below on a separate sheet of paper. Use the line to make a number line graph that represents all the possible numbers of hours plumber Smith can work on Julie's repair job. Show your work **and** explain your thinking.



- B** Plumber Brown has an hourly rate plus a flat fee of \$40 . She tells Julie that the total cost of her repair job will be less than \$265 .

The graph made in **Part A** also represents all the possible numbers of hours plumber Brown can work on Julie's repair job.

How much greater, in dollars, is plumber Brown's hourly rate than plumber Smith's hourly rate? Show your work or explain your thinking.

**8** What is the decimal equivalent of  $\frac{7}{8}$  ?

- A 0.78
- B 0.875
- C 0.935
- D 1.14

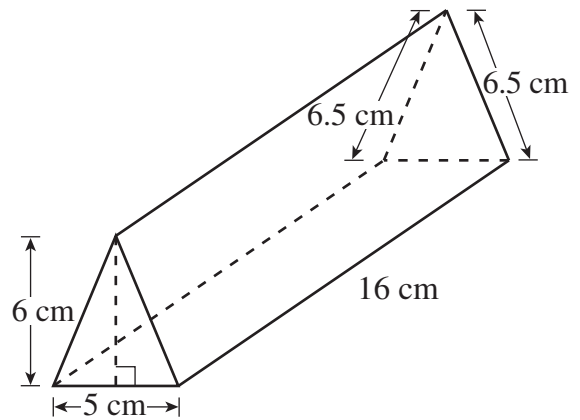
**9** Heather and Todd each earn \$12.00 per hour.

- Heather receives a raise of \$0.50 per hour, followed by a 10% raise.
- Todd receives a 10% raise, followed by a raise of \$0.50 per hour.

How much more does Heather earn per hour now than Todd does now?

- A \$0.00
- B \$0.05
- C \$1.15
- D \$1.75

**10** A triangular prism is pictured below.



What is the surface area of the prism?

- A  $240 \text{ cm}^2$
- B  $270 \text{ cm}^2$
- C  $318 \text{ cm}^2$
- D  $348 \text{ cm}^2$

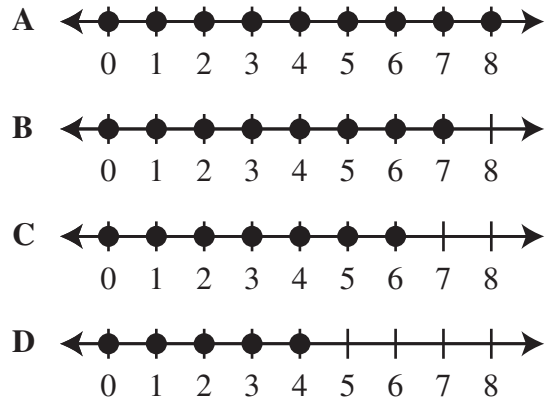
**11** Which expression is equivalent to  $-8 - 12$  ?

- A  $-8 + (-12)$
- B  $8 - 12$
- C  $-8 - (-12)$
- D  $8 + 12$

- 12** George uses  $\frac{4}{5}$  gallon of paint to cover  $\frac{3}{10}$  of a wall. At this rate, what is the total amount of paint George would use to cover the entire wall?

- A  $\frac{6}{25}$  gallon  
 B  $\frac{3}{8}$  gallon  
 C  $1\frac{1}{10}$  gallons  
 D  $2\frac{2}{3}$  gallons

- 13** Vincent is buying jeans from an online store. He has \$140 to spend on jeans and shipping. The jeans cost \$20 per pair. The shipping cost is a flat fee of \$15. Which graph **best** represents all the possible numbers of pairs of jeans Vincent can buy?



Write your answer to Question 14 on a separate sheet of paper. Be sure to answer Parts A and B.

**14**

The amounts described below are always shown on Christine's grocery receipt.

- total cost before any coupons and store card discounts are applied
  - total amount paid after coupons and store card discounts are applied
  - total amount saved from coupons and store card discounts
  - total amount saved as a percent of total cost
- A** Last week, Christine's receipt showed that the total amount saved was \$32.40 . The receipt also showed that the total amount saved, \$32.40, was 40% of the total cost before any coupons and store card discounts were applied. What is the total amount paid after coupons and store card discounts were applied? Show your work or explain your thinking.
- B** This week, the total amount paid was 400% of the total amount saved. What percent of the total cost were savings? Show or explain all your work.

- 15** Which expression is equivalent to  $3(x + 4) + 2(x + 7)$  ?
- A  $5x + 11$
  - B  $5x + 26$
  - C  $12x + 26$
  - D  $12x + 66$
- 16** A full sack of sugar contains 42 cups. José has a sack of sugar that is  $\frac{1}{3}$  full. He uses  $\frac{2}{3}$  cup of sugar for each batch of cookies he bakes. How many batches of cookies can he bake using all the sugar he has?
- A  $9\frac{1}{3}$  batches
  - B 21 batches
  - C  $63\frac{1}{2}$  batches
  - D 84 batches

- 17** John made 4 withdrawals of \$36 each from his savings account last month. During that month, he did not make any deposits to his account, and did not make any additional withdrawals. Which could be represented by the product of  $-36 \cdot 4$  ?
- A the total amount of money, in dollars, John withdrew from his savings account last month
  - B the change in the amount of money, in dollars, John withdrew each of the 4 times last month
  - C the amount of money, in dollars, remaining in John's savings account after his 4 withdrawals last month
  - D the change in the total amount of money, in dollars, in John's savings account after his 4 withdrawals last month

- 18** An equation is shown below.

$$\frac{1}{2}(x - 2) = 1$$

What is the solution of the equation?

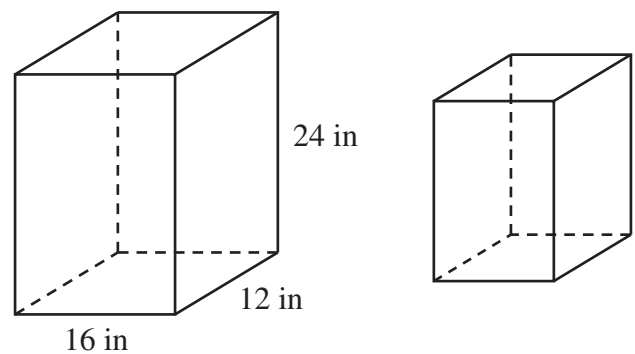
- A 0
- B 1
- C 4
- D 6



- 19** The regular price of a video game at a store is \$57. The store is having a sale of 35% off the regular price of each video game in the store. Which equation can be used to determine the amount of money ( $d$ ), in dollars, that will be taken off the regular price of each video game?

- A  $\frac{35}{100} = \frac{d}{57}$   
B  $\frac{35}{100} = \frac{57}{d}$   
C  $\frac{57}{100} = \frac{35}{d}$   
D  $\frac{35}{57} = \frac{57}{d}$

- 20** Two rectangular prisms are pictured below.



Each dimension of the smaller prism is  $\frac{3}{4}$  the corresponding dimension of the larger prism. What is the difference between the volumes of the prisms?

- A 72 in<sup>3</sup>  
B 222 in<sup>3</sup>  
C 1,152 in<sup>3</sup>  
D 2,664 in<sup>3</sup>

Write your answer to Question 21 on a separate sheet of paper. Be sure to answer Parts A and B.

**21**

Carmen works at a store. She earns \$8.40 per hour and works  $37\frac{1}{2}$  hours each week.

**A** What amount, in dollars, does Carmen earn each week at the store? Show your work.

**B** Carmen's weekly budget is described below.

- She spends  $\frac{2}{5}$  of her earnings on rent.
- She spends  $\frac{4}{3}$  of the amount she spends on rent for food, clothing, and other expenses.
- She saves all her remaining earnings.

Carmen wants to save exactly \$1,000.00 in 40 weeks of work. She is only paid when she completes a full week of work. By what amount, in dollars, does Carmen need to change her spending on food, clothing, and other expenses each week in order to save exactly \$1,000.00 in 40 weeks?

As part of your answer, indicate whether the change is an increase or a reduction in spending. Show your work **and** explain your thinking.

**22** Simplify:

$$(-6)\left(\frac{-3-7.4}{\frac{1}{2}}\right)$$

- A 15.6
- B 31.2
- C 52.8
- D 124.8

**23** Jacob uses flat circular stepping stones to make a garden path. The area of the circular top of each stepping stone is  $36\pi$  square inches. What is the circumference of the top of each stepping stone?

- A  $3\pi$  inches
- B  $6\pi$  inches
- C  $12\pi$  inches
- D  $24\pi$  inches

**24** A customer pays a monthly fee of \$25.00 for a mobile phone plan. The customer pays an additional \$0.20 for each text message sent. The customer can pay at most \$45.00 each month. Which statement describes all the possible numbers of text messages the customer could send in a month?

- A The customer can send 100 or fewer text messages in a month.
- B The customer must send less than 100 text messages in a month.
- C The customer can send 200 or fewer text messages in a month.
- D The customer must send more than 200 text messages in a month.

**25** Which expression is equivalent to

$$\left(-\frac{2}{3} + \frac{1}{4}\right) + \frac{1}{2} ?$$

- A  $-\left(\frac{2}{3} + \frac{1}{4} - \frac{1}{2}\right)$
- B  $\left(\frac{1}{4} + \frac{1}{2}\right) - \frac{2}{3}$
- C  $\left(-\frac{2}{3} + \frac{1}{2}\right) + \left(\frac{1}{4} + \frac{1}{2}\right)$
- D  $\left(\frac{1}{4} + \frac{2}{3}\right) + \frac{1}{2}$

**26** On Monday, the value of a certain stock is \$2.50 per share. On Tuesday, the value of the stock increases by  $\frac{1}{5}$  of its value on Monday. On Wednesday, the value of the stock decreases by 20% of its value on Tuesday. What is the value of each share of the stock at the end of the day on Wednesday?

- A \$2.40
- B \$2.50
- C \$2.60
- D \$2.90

**27**

Which table shows a proportional relationship between the number of books purchased and the cost of the books?

**A Books Purchased**

Number of Books	Cost (\$)
1	8
4	24
8	40
12	56

**C Books Purchased**

Number of Books	Cost (\$)
2	10
4	15
6	20
8	25

**B Books Purchased**

Number of Books	Cost (\$)
1	8
4	32
9	54
12	72

**D Books Purchased**

Number of Books	Cost (\$)
2	16
5	40
6	48
15	120

Write your answer to Question 28 on a separate sheet of paper. Be sure to answer Parts A and B.

**28**

Bella's class is drawing triangles. The first triangle she must draw has the side lengths listed below.

**3 cm   4 cm   5 cm**

- A** Using the grid on a separate sheet of paper, create a scale drawing of the first triangle Bella must draw. Be sure to show the scale you use.
- B** The teacher tells the class they can change exactly two of the interior angle measures listed below by  $5^\circ$  and they would be able to draw a second triangle.

**$55^\circ$     $60^\circ$     $75^\circ$**

Bella thinks she can then draw three possible triangles. List the measures of the interior angles in the three triangles Bella thinks she can draw. Explain why she can actually draw an infinite number of triangles using the new interior angle measures.

**29** What is  $\frac{1}{2}\%$  of  $11.3 + 38.7$  ?

A  $\frac{1}{4}$

B  $2\frac{1}{2}$

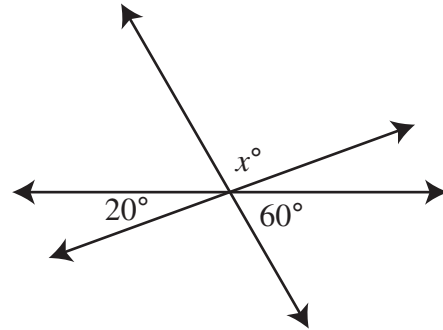
C 25

D 2,500

**30** A duck is resting on the surface of a lake, at an altitude of 0 feet above sea level. It dives to -5 feet to eat. Then it returns to the surface. Which of these occurred between the time the duck ate and the time it returned to the surface?

- A The duck's altitude increased by 5 feet.
- B The duck's altitude decreased by 5 feet.
- C The duck's altitude increased by 10 feet.
- D The duck's altitude remained the same.

**31** The diagram below shows three lines intersecting at the same point.



What is the value of  $x$  ?

- A 10
- B 80
- C 100
- D 280

- 32** An expression is shown below.

$$-8\left(\frac{1}{4}x - 3\right)$$

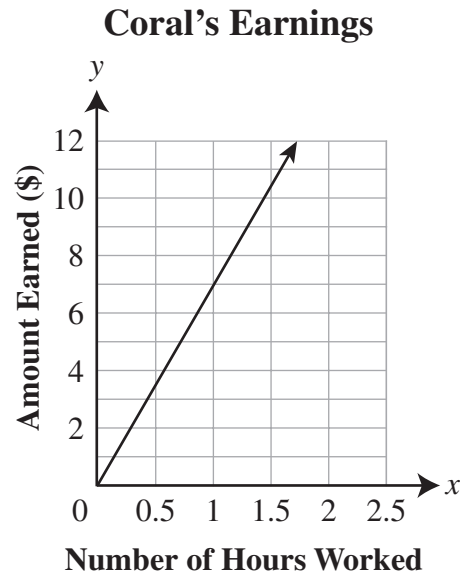
Which expression is equivalent to the expression shown?

- A  $-\frac{1}{2}x - 3$   
 B  $-\frac{1}{2}x + 24$   
 C  $-2x - 24$   
 D  $-2x + 24$

- 33** A performer is riding a unicycle on a high wire. The radius of the wheel of the unicycle is 10 inches. The length of the high wire is 314 inches. About how many times will the wheel have made a complete revolution after the performer rides the unicycle one time along the entire length of the high wire? (Use  $\pi = 3.14$ )

- A 1  
 B 5  
 C 10  
 D 31

- 34** Coral works at a flower shop. The amount of money Coral earns is proportional to the number of hours she works, as represented in the graph below.

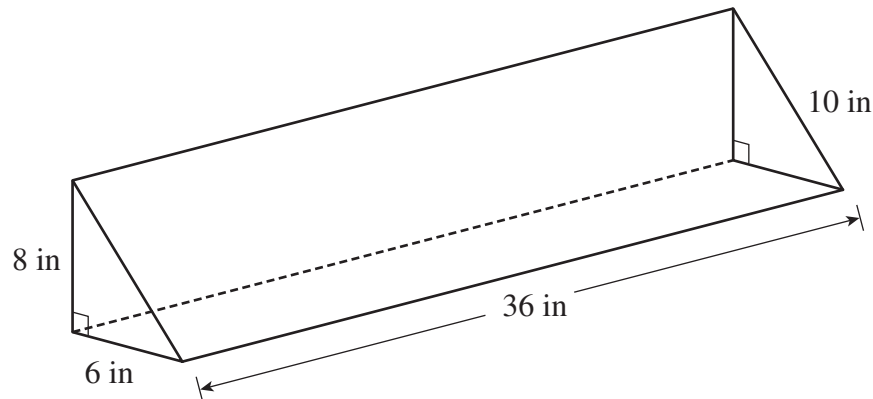


Which equation **best** describes the relationship between the number of hours ( $x$ ) Coral works and the amount of money ( $y$ ) she earns?

- A  $y = \frac{1}{7}x$   
 B  $y = 2.5x$   
 C  $y = 3.5x$   
 D  $y = 7x$

Write your answer to Question 35 on a separate sheet of paper. Be sure to answer Parts A and B.

- 35** Martina ships a package inside a cardboard container. The container is in the shape of a triangular prism and has a length of 36 in, as pictured below.



- A** Martina tries to determine the volume of the container, but she makes an error. She uses the expression below in determining the volume.

$$36(8 \cdot 6 \cdot 10)$$

Explain the error Martina makes in trying to determine the volume of the container and determine the correct volume, in cubic inches. Show your work.

- B** Martina ships another package and uses a new cardboard container in the shape of a triangular prism. The new container has the same base dimensions as the original container, but its length is  $\frac{3}{4}$  the length of the original container. Without calculating the volume of the new container, determine by what percent the volume of the new container is less than the volume of the original container. Show your work or explain your thinking.



**36**

Nancy shops at a clothing store.

- Sales tax is added to the price of any item bought.
- The total amount, in dollars, Nancy pays for any item she buys at the store with a price of  $p$  dollars is described by the expression  $p + 0.08p$ .

Nancy buys jeans at this store.

- The jeans originally cost  $x$  dollars.
- They are on sale.
- The sale price, in dollars, of the jeans is described by the expression  $x - 0.25x$ .

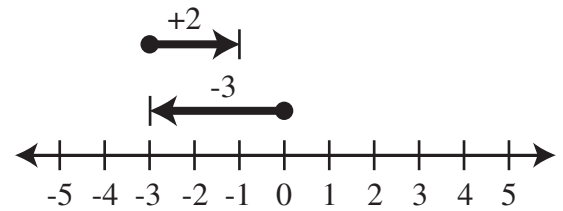
Which expression describes the total amount, in dollars, Nancy pays for the jeans?

- A  $0.58x$
- B  $0.77x$
- C  $0.81x$
- D  $0.83x$

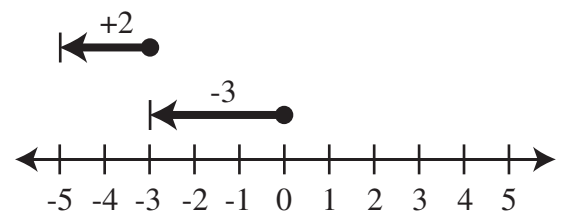
**37**

Which number line diagram could be used to determine the sum of  $-3 + 2$ ?

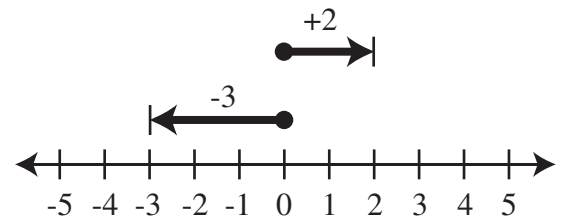
A



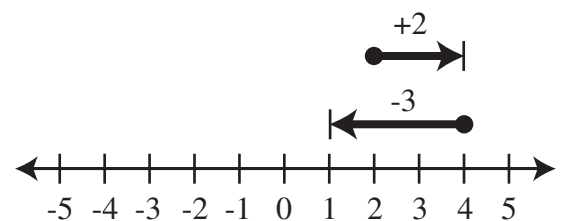
B



C



D



**38** Which expression is equivalent to  $\frac{5}{4}x - 2$  ?

- A  $\left(5x + \frac{1}{4}x\right) + (6 - 4)$   
 B  $\left(2x - \frac{3}{4}x\right) + (4 - 2)$   
 C  $(x + 4) - \left(\frac{1}{4}x + 6\right)$   
 D  $(2x + 2) - \left(\frac{3}{4}x + 4\right)$

**39** Adele is considering two investment plans.

- plan A: invest \$2,500 at a simple interest rate of 3.5% per year for 3 years
- plan B: invest \$5,000 at a simple interest rate of 4.0% per year for 1 year

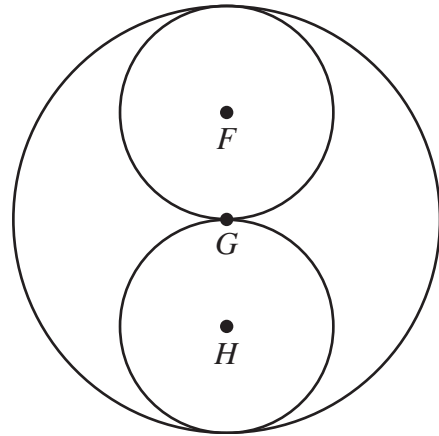
Which statement about the two investment plans is true?

- A Adele would earn \$337.50 less with plan A than with plan B .  
 B Adele would earn \$25 more with plan A than with plan B .  
 C Adele would earn \$62.50 more with plan A than with plan B .  
 D Adele would earn \$6,250 more with plan A than with plan B .

**40** Margaret makes 12 backpacks and sells them. Each backpack costs her \$16.00 to make. The sales price of each backpack is the cost to make the backpack plus a profit. Margaret's profit on each backpack is  $\frac{2}{5}$  of her cost to make the backpack. What is the total sales price of all 12 backpacks?

- A \$76.80  
 B \$196.80  
 C \$268.80  
 D \$672.00

**41** In the figure below, circle  $F$  and circle  $H$  are the same size. Point  $G$  is the center of the largest circle.



The area of circle  $G$  is  $49\pi \text{ cm}^2$  . What is the area of circle  $F$  ?

- A  $7\pi \text{ cm}^2$   
 B  $12.25\pi \text{ cm}^2$   
 C  $16.3\pi \text{ cm}^2$   
 D  $24.5\pi \text{ cm}^2$

Write your answer to Question 42 on a separate sheet of paper. Be sure to answer Parts A and B.

**42**

A restaurant uses a recipe to make a batch of fruit drink.

- Each batch of the fruit drink uses  $\frac{3}{4}$  gallon of orange juice.
- Each recipe makes 3 gallons of fruit drink.

The owner of the restaurant is trying a new recipe for the fruit drink by increasing the amount of orange juice by 50%. The owner thinks the percent of orange juice in each batch using the new recipe is 75%.

- A** Explain in detail why the owner is incorrect. As part of your explanation, determine the percent of orange juice that is in each batch using the new recipe. Show or explain all your work.
- B** A worker at the restaurant makes 1 batch of the original recipe and 1 batch of the new recipe and mixes the batches together. What percent of the mixture is orange juice? Show or explain all your work.

## Correct Answers for Multiple-Choice Items

### Item Level Data

Item Number	NVACS*	DOK	P-value
1	7.NS.2c	1	0.21
2	7.EE.2	2	0.37
3	7.G.5	1	0.51
4	7.G.2	1	0.54
5	7.EE.4a	1	0.51
6	7.NS.3	2	0.51
7	7.EE.4b	3	N/A
8	7.NS.2d	1	0.52
9	7.EE.3	2	0.21
10	7.G.6	1	0.25
11	7.NS.1c	1	0.49
12	7.RP.1	2	0.29
13	7.EE.4b	2	0.34
14	7.RP.3	3	N/A
15	7.EE.1	1	0.30
16	7.NS.3	2	0.42
17	7.NS.2a	2	0.23
18	7.EE.4a	1	0.45
19	7.RP.2c	1	0.45
20	7.G.6	2	0.21
21	7.NS.3	3	N/A
22	7.NS.3	1	0.14

### Percentage of Students Selecting a Given Response

A	B	C	D
27%	29%	22%	21% ✓
37% ✓	38%	16%	9%
16%	18%	14%	51% ✓
16%	14%	54% ✓	15%
24%	51% ✓	15%	10%
27%	51% ✓	14%	8%
---	---	---	---
31%	52% ✓	8%	9%
45%	21% ✓	22%	12%
28%	26%	25% ✓	20%
49% ✓	16%	24%	11%
18%	20%	32%	29% ✓
9%	16%	34% ✓	40%
---	---	---	---
32%	30% ✓	29%	8%
40%	42% ✓	11%	6%
37%	17%	22%	23% ✓
12%	33%	45% ✓	10%
45% ✓	24%	20%	10%
27%	29%	23%	21% ✓
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23%	37%	25%	14% ✓

\* Nevada Academic Content Standards

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

✓ = Correct Answer

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## Correct Answers for Multiple-Choice Items (continued)

**Item Level Data**

Item Number	NVACS*	DOK	P-value
23	7.G.4	2	0.45
24	7.EE.4b	2	0.39
25	7.NS.1d	1	0.37
26	7.EE.3	2	0.26
27	7.RP.2a	1	0.48
28	7.G.2	3	N/A
29	7.EE.3	1	0.12
30	7.NS.1a	1	0.31
31	7.G.5	1	0.50
32	7.EE.1	1	0.21
33	7.G.4	2	0.19
34	7.RP.2c	2	0.26
35	7.G.6	3	N/A
36	7.EE.2	2	0.26
37	7.NS.1b	1	0.56
38	7.EE.1	1	0.14
39	7.RP.3	2	0.34
40	7.NS.3	2	0.28
41	7.G.4	2	0.21
42	7.EE.3	3	N/A

**Percentage of Students Selecting  
a Given Response**

A	B	C	D
9%	36%	45% ✓	10%
39% ✓	20%	25%	15%
16%	37% ✓	23%	23%
26% ✓	38%	20%	15%
11%	15%	25%	48% ✓
---	---	---	---
12% ✓	19%	61%	7%
31% ✓	46%	8%	16%
7%	37%	50% ✓	5%
22%	27%	30%	21% ✓
7%	19% ✓	24%	49%
27%	31%	16%	26% ✓
---	---	---	---
31%	24%	26% ✓	19%
56% ✓	9%	29%	6%
30%	29%	27%	14% ✓
27%	22%	34% ✓	16%
26%	39%	28% ✓	7%
28%	21% ✓	19%	32%
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\* Nevada Academic Content Standards

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

✓ = Correct Answer

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