

Unit 1

Directions:

Today, you will take Unit 1 of the Grade 6 Mathematics Practice Test. Unit 1 has two sections. In the first section, you may not use a calculator. In the second section, you may use a calculator. **You will not be allowed to return to the first section of the test after you start the calculator section.** You must complete both the non-calculator and calculator sections of Unit 1 within the time allowed.

Read each question. Then, follow the directions to answer each question. Mark your answers by completely filling in the circles in your answer document. Do not make any pencil marks outside of the circles. If you need to change an answer, be sure to erase your first answer completely. If a question asks you to show or explain your work, you must do so to receive full credit. Only responses written within the provided space will be scored.

If you do not know the answer to a question, you may go on to the next question. When you finish the first section, you may review your answers and any questions you did not answer in this section **ONLY**. Once you have reviewed your answers, continue to the calculator section. When you are ready to go on to the calculator section, raise your hand to receive your calculator.

Directions for Completing the Answer Grids

1. Work the problem and find an answer.
2. Write your answer in the boxes at the top of the grid.
3. Print only one number or symbol in each box. Do not leave a blank box in the middle of an answer.
4. Under each box, fill in the circle that matches the number or symbol you wrote above. Make a solid mark that completely fills the circle.
5. Do not fill in a circle under an unused box.
6. Fractions cannot be entered into an answer grid and will not be scored. Enter fractions as decimals.
7. See below for examples on how to correctly complete an answer grid.

EXAMPLES

To answer -3 in a question, fill in the answer grid as shown below.

-	3				
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
<input checked="" type="radio"/>	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

To answer $.75$ in a question, fill in the answer grid as shown below.

.	7	5			
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	<input checked="" type="radio"/>	5	5	5
6	6	6	6	6	6
7	<input checked="" type="radio"/>	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

Unit 1 - Section 1 (Non-Calculator)

This unit has two sections: a non-calculator section and a calculator section.

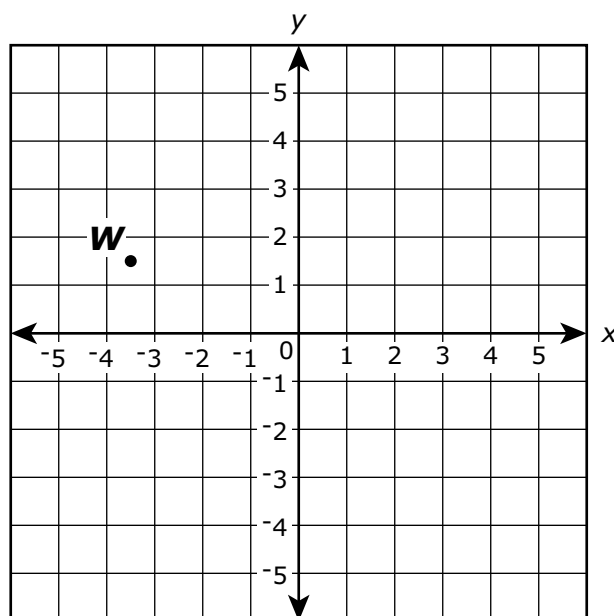
You will now take the non-calculator section of this unit in which you may not use a calculator. You will not be allowed to return to the first section of the test after you start the calculator section. You must complete both sections within the time allowed for this unit.

Once you finish the non-calculator section, read the directions in your test booklet on how to continue.

1. A class of 25 students shares a class set of 100 markers. On a day with 5 students absent, which statement is true?
 - A. For every 5 students, there is 1 marker.
 - B. For every 4 students, there is 1 marker.
 - C. For each student, there are 4 markers.
 - D. For each student, there are 5 markers.

2. The area of a rectangular patio is $5\frac{5}{8}$ square yards, and its length is $1\frac{1}{2}$ yards. What is the patio's width, in yards?
 - A. $3\frac{3}{4}$
 - B. $4\frac{1}{8}$
 - C. $7\frac{1}{8}$
 - D. $8\frac{7}{16}$

3. This coordinate plane shows the location of point W .



What is the value of the x -coordinate of point W ? Enter your answer as a decimal to the nearest 0.5.

Enter your answer in the box.

4. Enter your answer in the box.

$$33.8 \div 32.5 =$$

5. Which equations with exponential expressions are true?

Select **all** that apply.

A. $3^3 = 3 \cdot 3$

B. $5^2 = 5 \cdot 5$

C. $5^4 = 4 \cdot 4 \cdot 4 \cdot 4$

D. $7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 = 6^7$

E. $7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 = 7^6$

F. $7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 = 7^7$

6. Enter your answer in the box.

$$34,992 \div 81 =$$

7. These five rational numbers are plotted on a horizontal number line.

$$-\frac{2}{3}, \frac{7}{8}, -\frac{4}{5}, \frac{7}{10}, -\frac{4}{3}$$

Which statement about the locations on the number line of the rational numbers is true?

A. $-\frac{2}{3}$ is farthest to the left, and $\frac{7}{8}$ is farthest to the right.

B. $-\frac{4}{3}$ is farthest to the left, and $\frac{7}{8}$ is farthest to the right.

C. $-\frac{2}{3}$ is farthest to the left, and $\frac{7}{10}$ is farthest to the right.

D. $-\frac{4}{3}$ is farthest to the left, and $\frac{7}{10}$ is farthest to the right.

8. What is the greatest common factor of 16 and 48?

Enter your answer in the box.

9. Select each expression that is equivalent to $3(n + 6)$.

Select **all** that apply.

A. $3n + 6$

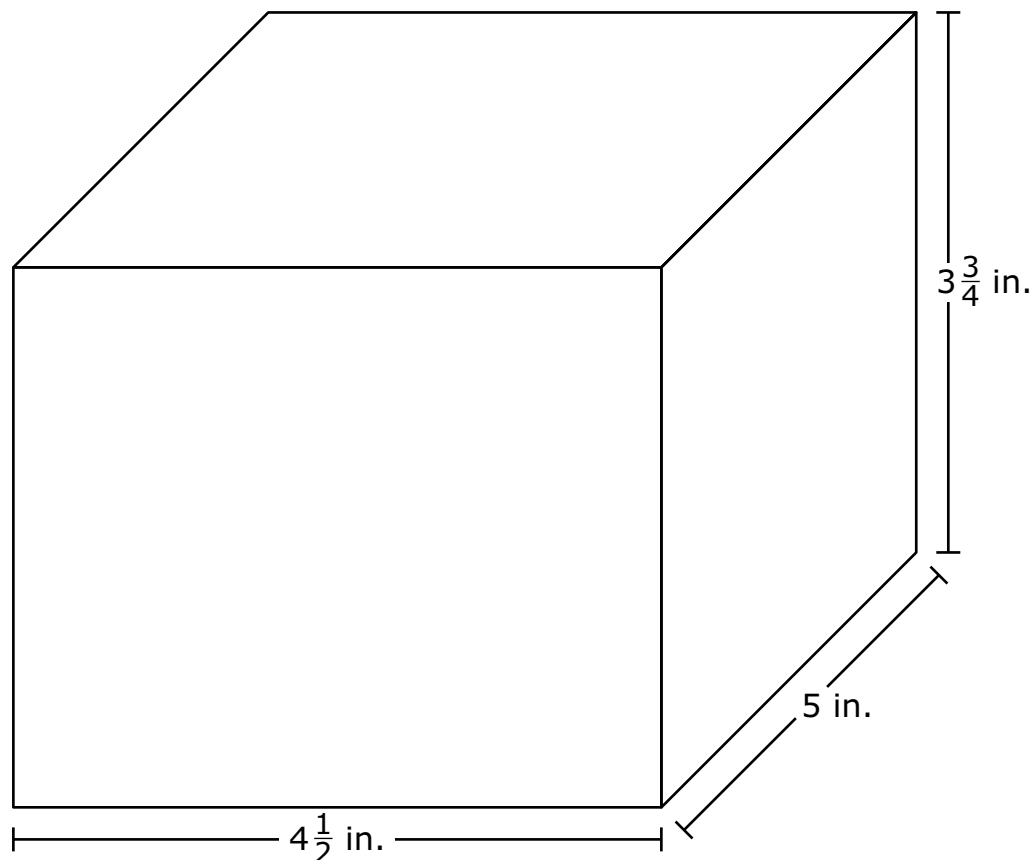
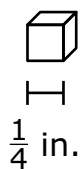
B. $3n + 18$

C. $2n + 2 + n + 4$

D. $2(n + 6) + (n + 6)$

E. $2(n + 6) + n$

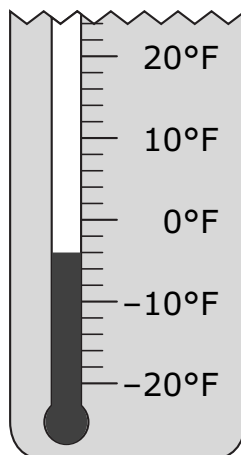
10. Small cubes with edge lengths of $\frac{1}{4}$ inch will be packed into the right rectangular prism shown.



How many small cubes are needed to completely fill the right rectangular prism?

Enter your answer in the box.

- 11.** The picture shows part of a thermometer measuring temperature in degrees Fahrenheit.



What is the temperature, in degrees Fahrenheit, shown on the thermometer to the nearest integer?

Enter your integer answer in the box.

- 12.** Marshall took \$36.75 to a fair. Each ticket into the fair costs x dollars. Marshall bought 3 tickets. Which expression represents the amount of money, in dollars, that Marshall had after he bought the tickets?
- A.** $36.75 - (3 + x)$
- B.** $36.75x - 3$
- C.** $36.75(3) - x$
- D.** $36.75 - 3x$

- 13.** Which question is a statistical question?
- A.** How tall is the oak tree?
 - B.** How much did the tree grow in one year?
 - C.** What are the heights of the oak trees in the schoolyard?
 - D.** What is the difference in height between the oak tree and the pine tree?
- 14.** The median number of points scored by 9 players in a basketball game is 12. The range of the numbers of points scored by the same basketball players in the same game is 7.
- Which statement is true based on the given information?
- A.** At least one player scored 12 points.
 - B.** The greatest number of points scored is less than 19 points.
 - C.** The mean number of points scored is greater than 12 points.
 - D.** If the greatest number of points scored is 16, then the least number of points scored is 4.





Unit 1 - Section 2 (Calculator)

Once you have received your calculator, continue into the calculator section.



15. Which expression represents “6 more than x ”?

A. $x - 6$

B. $6 \cdot x$

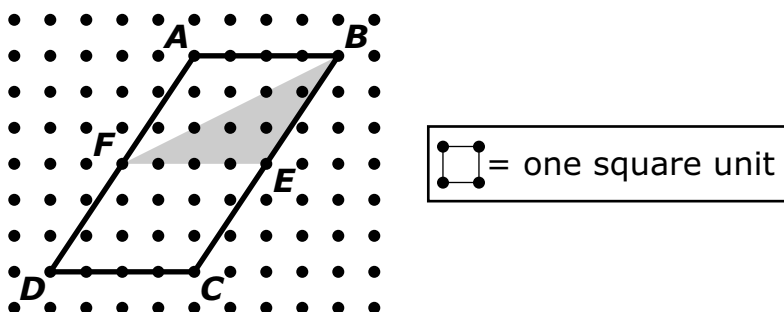
C. $x + 6$

D. $6 - x$



Use the information provided to answer Part A and Part B for question 16.

An advertising company is designing a new logo that consists of a shaded triangle inside a parallelogram.



16. Part A

What is the area, in square units, of parallelogram $ABCD$?

Enter your answer in the box.

Part B

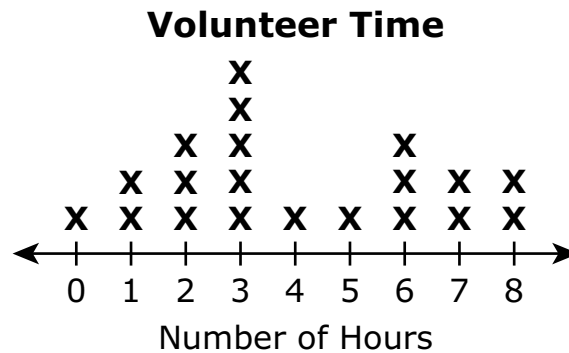
In the new logo, what fraction of the parallelogram is shaded?

- A. $\frac{1}{12}$
- B. $\frac{1}{6}$
- C. $\frac{1}{4}$
- D. $\frac{1}{3}$



Use the information provided to answer Part A and Part B for question 17.

Janet surveyed a class of students. She recorded the number of hours that each student volunteered. This line plot shows the results of the survey.



17. Part A

How many students did Janet survey?

Enter your answer in the box.

Part B

What is the mean number of hours volunteered by the students in the survey?

Enter your answer in the box.





Unit 2 (Calculator)

Directions:

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Read each question. Then, follow the directions to answer each question. Mark your answers by completely filling in the circles in your answer document. Do not make any pencil marks outside of the circles. If you need to change an answer, be sure to erase your first answer completely. If a question asks you to show or explain your work, you must do so to receive full credit. Only responses written within the provided space will be scored.

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7. See below for examples on how to correctly complete an answer grid.

EXAMPLES

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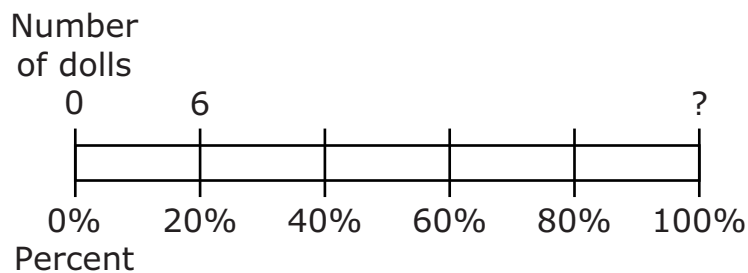


- 18.** Let x represent any number in the set of even integers greater than 1.

Which inequality is true for all values of x ?

- A.** $x < 0$
- B.** $x > 0$
- C.** $x < 4$
- D.** $x > 4$

- 19.** Anita brings 6 dolls to her grandma's house. These dolls represent 20% of Anita's doll collection, as shown in the diagram.



What is the total number of dolls in Anita's doll collection?

Enter your answer in the box.



- 20.** A company makes yellow golf balls and white golf balls. The table shows the company's sales of yellow golf balls for the last 3 years.

Yellow Golf Balls

Year	Number of Yellow Golf Balls Sold
1	204,132
2	225,624
3	237,108

- The company expects sales of yellow golf balls to continue to increase in year 4.
- The company also expects the ratio of yellow golf ball sales to white golf ball sales in year 4 to be about 1 : 5 .
- The average selling price of a box of 12 yellow or 12 white golf balls is \$23.94.

Estimate the company's total sales, in dollars, of golf balls in year 4. Show all your work. Explain how you determined your estimate.

Enter your estimate, your work, and your explanation in the space provided.



Use the information provided to answer Part A through Part D for question 21.

Chad drove 168 miles in 3 hours.

21. Part A

How many miles per hour did Chad drive?

Enter your answer in the box.

Part B

Chad will drive 672 more miles. He continues to drive at the same rate.

How many hours will it take Chad to drive the 672 miles?

Enter your answer in the box.

Part C

Chad stopped and filled the car with 11 gallons of gas. He had driven 308 miles using the previous 11 gallons of gas.

How many miles per gallon did Chad's car get?

Enter your answer in the box.

Part D

Chad's car continues to get the same number of miles per gallon.

How many gallons of gas will Chad's car use to travel 672 miles?

Enter your answer in the box.



Use the information provided to answer Part A and Part B for question 22.

The number of blueberry muffins that a baker makes each day is 40% of the total number of muffins she makes.

22. Part A

On Monday, the baker makes 36 blueberry muffins.

What is the total number of muffins that the baker makes on Monday?

Enter your answer in the box.

Part B

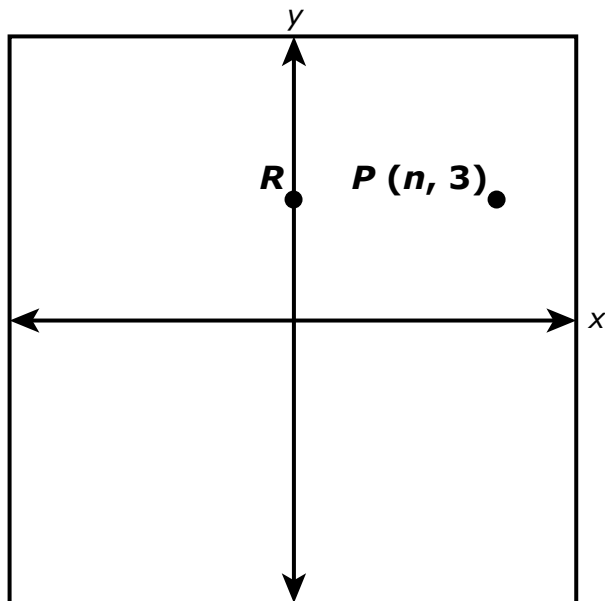
On Tuesday, the baker makes a total of 60 muffins.

How many blueberry muffins does the baker make on Tuesday?

Enter your answer in the box.



23. The graph shows the location of point P and point R . Point R is on the y -axis and has the same y -coordinate as point P .



Point Q is graphed at $(n, -2)$. The distance from point P to point Q is equal to the distance from point P to point R .

What is the distance from point P to point Q ? What is the value of n ? Explain how you determined the distance from point P to point Q , and the value of n .

Enter your answers and your explanations in the space provided.





Unit 3

(Calculator)

Directions:

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EXAMPLES

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-	3				
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0	0	0	0	0	0
1	1	1	1	1	1
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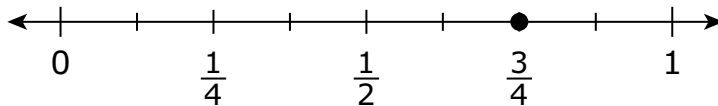
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<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	<input checked="" type="radio"/>	5	5	5
6	6	6	6	6	6
7	<input checked="" type="radio"/>	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9



Use the information provided to answer Part A and Part B for question 24.

This diagram shows a number line.

**24. Part A**

James has a board that is $\frac{3}{4}$ foot long. He wants to cut the board into pieces that are each $\frac{1}{8}$ foot long.

How many pieces can James cut from the board? Explain how James can use the number line diagram to determine the number of pieces he can cut from the board.

Enter your answer and your explanation in the space provided.

Part B

Write an equation using division that represents how James can find the number of pieces he can cut from the board.

Enter your equation in the space provided.



Use the information provided to answer Part A and Part B for question 25.

Greg bought 4 notebooks for \$6.40.

25. Part A

Which equation can be used to determine the price, p , in dollars, of 1 notebook?

A. $\frac{p}{4} = 6.40$

B. $\frac{p}{6.40} = 4$

C. $4p = 6.40$

D. $6.40p = 4$

Part B

What is the price, in dollars, of 1 notebook?

Enter your answer in the box.

**26. Part A**

A group of hikers buys 8 bags of mixed nuts. Each bag contains $3\frac{1}{2}$ cups of mixed nuts. The mixed nuts are shared evenly among 12 hikers. How many cups of mixed nuts will each hiker receive? Show your work or explain your answer.

Enter your answer and your work or explanation in the space provided.

Part B

The hikers plan to visit a scenic lookout. They will rest after they hike 2 miles. Then they will hike the remaining $1\frac{3}{4}$ miles to the lookout. The trail the hikers will use to return from the lookout is $\frac{1}{2}$ mile shorter than the trail they will use to go to the lookout. Each hiker will bring $\frac{1}{4}$ gallon of water for each mile to and from the lookout.

- Determine the total distance, in miles, each hiker will hike. Show your work or explain your answer.
- Determine the total number of gallons of water each hiker will bring. Show your work or explain your answer.

Enter your answers and your work or explanations in the space provided.

27. There are 5,280 feet in 1 mile. How many inches are in 2 miles?

- A.** 10,560
- B.** 63,360
- C.** 126,720
- D.** 253,440



- 28.** Sam's two new aquariums each hold exactly 200 gallons of water. One aquarium will hold small fish and the other will hold large fish. Now he needs new fish for his aquariums.

- He will buy 5 small fish for every 10 gallons of water in the aquarium.
- He will buy 8 large fish for every 40 gallons of water in the aquarium.

What is the total number of fish Sam will have? What will be the ratio of Sam's small fish to large fish? Show or explain the steps you used to solve this problem.

Enter your answers and your work or explanation in the space provided.

- 29.** Brianna's teacher asks her which of these three expressions are equivalent to each other.

Expression A: $9x - 3x - 4$

Expression B: $12x - 4$

Expression C: $5x + x - 4$

Brianna says that all three expressions are equivalent because the value of each one is -4 when $x = 0$.

Brianna's thinking is incorrect.

- Identify the error in Brianna's thinking.
- Determine which of the three expressions are equivalent.
- Explain or show your process in determining which expressions are equivalent.

Enter your answers and your explanation or process in the space provided.



Mathematics – Grade 6

Practice Test Answer and Alignment Document

Pencil-and-Paper ABO

The following pages include the answer key for all machine-scored items, followed by the rubrics for the hand-scored items.

- The rubrics show sample student responses. Other valid methods for solving the problem can earn full credit unless a specific method is required by the item.
- In items where the scores are awarded for full and partial credit, the definition of partial credit will be confirmed during range-finding (reviewing sets of real student work).
- If students make a computation error, they can still earn points for reasoning or modeling.

Unit 1

Item Number	Answer Key	Evidence Statement Key/Content Scope
1.	D	6.RP.1
2.	A	6.NS.1-2
3.	-3.5	6.NS.6c-2
4.	1.04	6.NS.3-4
5.	B, E	6.EE.1-1
6.	432	6.NS.2
7.	B	6.NS.7a
8.	16	6.NS.4-1
9.	B, D	6.EE.4
10.	5400	6.G.2-1
11.	-4	6.NS.6c-1

12.	D	6.EE.6
13.	C	6.SP.1
14.	A	6.SP.3
15.	C	6.EE.2a
16.	Part A: 24 Part B: C	6.G.1
17.	Part A: 20 Part B: 4	6.SP.5

Unit 2

Item Number	Answer Key	Evidence Statement Key/Content Scope
18.	B	6.EE.5-2
19.	30	6.RP.3c-1
20.	See rubric	6.D.3/6.RP.3
21.	Part A: 56 Part B: 12 Part C: 28 Part D: 24	6.RP.3b
22.	Part A: 90 Part B: 24	6.RP.3c-2
23.	See rubric	6.C.5/6.NS.8

Unit 3

Item Number	Answer Key	Evidence Statement Key/Content Scope
24.	Part A: see rubric Part B: see rubric	6.C.3/6.NS.1
25.	C, 1.60	6.EE.7

26.	Part A: see rubric Part B: see rubric	6.D.2/5.NF.3 and 5.NF.6
27.	C	6.RP.3d
28.	See rubric	6.D.1/6.RP.2 and 6.RP.3
29.	See rubric	6.C.7/6.EE.4

Rubrics start on the next page.

Unit 2 #20 Rubric	
Score	Description
3	<p>Student response includes each of the following 3 elements.</p> <ul style="list-style-type: none"> Valid estimate for the company's total sales in year 4 Valid explanation for determining the estimate Valid work to support the estimate <p>Sample Student Response:</p> <p>I estimated the sales of yellow golf balls in year 4 to be about 250,000. Since the company expects sales to continue to increase and the table shows sales increased by about 21,000 in year 2 and by about 11,000 in year 3, I estimated an increase of about 15,000 in year 4. Adding $237,000 + 15,000$, I get 252,000 or about 250,000 yellow golf balls sold in year 4. Next, I determined the number of white golf balls sold in year 4 using the given ratio. Since I estimated 250,000 yellow golf balls and the ratio of yellow to white is 1:5, I multiplied $2,500 \times 5$ get 1,250,000 white golf balls.</p> <p>I added $250,000 + 1,250,000$ to get an estimate of 1.5 million golf balls sold in year 4. Next, I determined the number of boxes sold in year 4 to be 125,000 since $1,500,000 \div 12 = 125,000$. Finally, I came up with my estimate by multiplying the total number of boxes by \$24 per box (rounded up from \$23.94). So my estimate is \$3 million for year 4 since $125,000 \times 24 = 3,000,000$.</p> <p>Notes:</p> <ul style="list-style-type: none"> The student may receive a combined total of 2 points if the modeling process is correct, but the student makes one or more computational errors resulting in an incorrect answer. The student may receive a total of 1 point if he or she computes the correct answer, but shows no work or insufficient work to indicate a correct modeling process.
2	Student response includes 2 of the 3 elements.
1	Student response includes 1 of the 3 elements.
0	Student response is incorrect or irrelevant.

Unit 2 #23 Rubric	
Score	Description
4	Student response includes each of the following 4 elements.

	<ul style="list-style-type: none"> • Correct distance from point P to point Q, 5 • Valid explanation for determining the distance from point P to point Q • Valid explanation for determining the value of n • Correct value for n, 5 <p>Sample Student Response:</p> <p>The distance from point P to point Q is 5 units because point P is 3 units above the x axis. Point Q is 2 units below the x axis. So Point Q is 5 units below point P, therefore the distance from point P to point R is also 5 units. Since R is on the y axis, it has an x coordinate of 0. So the x coordinate of point P is 5 units to the right and is 5.</p> <p>The value for n is 5.</p>
3	Student response includes 3 of the 4 elements.
2	Student response includes 2 of the 4 elements.
1	Student response includes 1 of the 4 elements.
0	Student response is incorrect or irrelevant.

Unit 3 #24 Rubric Part A

Score	Description
2	<p>Student response includes each of the following 2 elements.</p> <ul style="list-style-type: none"> • Correct number of pieces, 6 • Valid explanation <p>Sample Student Response:</p> <p>The number line diagram shows segments marked that are spaced $\frac{1}{8}$ unit apart. I know James' board is $\frac{3}{4}$ foot long. I counted the number of $\frac{1}{8}$ units until I got to $\frac{3}{4}$ on the number line. There are 6 of these. So James can cut a total of 6 pieces from the board.</p>
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.

Unit 3 #24 Rubric Part B

Score	Description
1	<p>Student response includes the following element.</p> <ul style="list-style-type: none"> • Correct Equation

	Sample Student Response: $\frac{3}{4} \div \frac{1}{8} = 6$
0	Student response is incorrect or irrelevant.

Unit 3 #26 Rubric Part A

Score	Description
2	<p>Student response includes each of the following 2 elements.</p> <ul style="list-style-type: none"> • Correct number of cups of trail mix per hiker, $2\frac{1}{3}$ cups • Valid work or explanation shown <p>Sample Student Response:</p> <p>8 bags of trail mix at $3\frac{1}{2}$ cups per bag is</p> $8\left(3\frac{1}{2}\right) = \left(\frac{8}{1}\right)\left(\frac{7}{2}\right) = \frac{56}{2} = 28 \text{ cups.}$ <p>28 cups divided among 12 hikers is $\frac{28}{12} = \frac{7}{3} = 2\frac{1}{3}$ cups of trail mix per hiker.</p>
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.

Unit 3 #26 Rubric Part B

Score	Description
4	<p>Student response includes each of the following 4 elements.</p> <ul style="list-style-type: none"> • Correct number of miles hiked by each hiker, 7 miles • Correct work shown or explanation given to determine the number of miles hiked by each hiker • Correct total amount of water brought by each hiker, gallons • Correct work shown or explanation given to determine the total amount of water brought by each hiker <p>Sample Student Response:</p> <p>The distance to the scenic lookout:</p> $2 + 1\frac{3}{4} = \frac{8}{4} + \frac{7}{4}$ $= \frac{15}{4}$ <p>The distance back from the lookout is:</p>

	$\frac{15}{4} - \frac{1}{2} = \frac{15}{4} - \frac{2}{4}$ $= \frac{13}{4}$ <p>The total distance is:</p> $\frac{15}{4} + \frac{13}{4} = \frac{28}{4}$ $= 7$ <p>The total amount of water brought by each hiker is $\frac{1}{4}(7) = \frac{7}{4} = 1\frac{3}{4}$ gallons.</p>
3	Student response includes 3 of the 4 elements.
2	Student response includes 2 of the 4 elements.
1	Student response includes 1 of the 4 elements.
0	Student response is incorrect or irrelevant.

Unit 3 #28 Rubric	
Score	Description
3	<p>Student response includes the following 3 elements.</p> <ul style="list-style-type: none"> • Correct total number of fish • Correct ratio of small fish to large fish based on total number of fish • Valid work shown or explanation given <p>Sample Student Response:</p> <p>5 small fish for every 10 gallons means 1 small fish for every 2 gallons. There are 200 gallons in the tank, so there will be 100 small fish.</p> <p>8 large fish for every 40 gallons means 1 large fish for every 5 gallons. There are 200 gallons in the tank, so there will be 40 large fish.</p> <p>$100 + 40 = 140$ total fish</p> <p>The ratio of small fish to large fish will be 100 to 40 or 5 to 2.</p> <p>Note: Any equivalent ratio is acceptable. Also, students may show or explain their work using other valid strategies, such as making a table of equivalent ratios.</p>
2	Student response includes 2 of the 3 elements.

1	Student response includes 1 of the 3 elements.
0	Student response is incorrect or irrelevant.

Unit 3 #29 Rubric	
Score	Description
3	<p>Student response includes the following 3 elements.</p> <ul style="list-style-type: none"> • Explanation of why Brianna’s thinking is incorrect • Explanation of how to determine which expressions are equivalent • Identifies expressions A and C as equivalent <p>Sample Student Response:</p> <p>Brianna only checked the value of each expression for one substitution of x. To check which expressions are equivalent, I need to check that they are the same value for any substitution of x. Since expressions A and C are both equivalent to the expression $6x - 4$, they will be equivalent for any substitution of x, so they are equivalent.</p>
2	Student response includes 2 of the 3 elements.
1	Student response includes 1 of the 3 elements.
0	Student response is incorrect or irrelevant.