

Unit 1

Directions:

Today, you will be taking Unit 1 of the Grade 6 Mathematics Practice Test.

Read each question carefully. Some questions will ask you to choose one correct answer, while others will ask you to choose more than one correct answer. Mark your answers by filling in the circles in your Test Booklet for the answers you choose.

If a question asks you to show or explain your work, you must do so to receive full credit. Be sure to:

- Write your response in the box provided in your Test Booklet.
- Label each part of your work if a question has multiple parts, and clearly identify your answer for each part.
- Respond in the box provided. Crossed-out work, writing that falls outside of the box, or work on scratch paper will not be scored.

Do not make any stray marks on the Test Booklet. If you need to change an answer, be sure to erase your first answer completely.

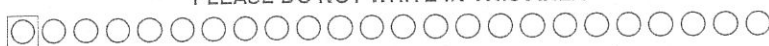
Calculator Directions:

In the first section of this unit, you may not use a calculator. You will not be allowed to return to the non-calculator section of the test after you have started the calculator section of the test.

If you do not know the answer to a question, skip it and go on. If you finish the non-calculator section of Unit 1 early, you may review your answers and any questions you may have skipped in the non-calculator section ONLY.

Do NOT go on to the calculator section in Unit 1 until directed to do so.

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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.
 - Print only one digit or symbol in each box. You may not need all the boxes to enter an answer, but do not leave a blank box in the middle of an answer.
3. Under each box in which you wrote your answer, fill in the bubble that matches the number or symbol you wrote above.
 - Fill in one and ONLY one bubble for each box. Do not fill in a bubble under an unused box.
 - Fill in each bubble by making a solid mark that completely fills the circle.
 - Fractions cannot be entered into an answer grid and will not be scored. Enter fractions as decimals.
4. See below for examples on how to correctly complete an answer grid.

To answer -3 in a question, fill in the answer grid as follows:

-	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 follows:

.	7	5			
<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
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 and a calculator section.

You will now take the first section of this unit in which you may not use a calculator. You will not be allowed to return to the non-calculator section of the test after you have started the calculator section. You will need to finish both sections within the allotted testing time.

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? *Ratio! "For every..."*

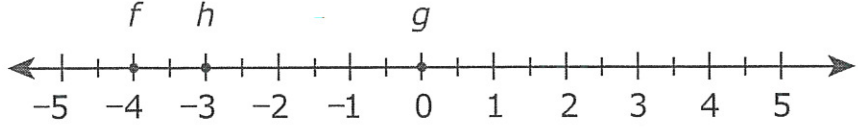
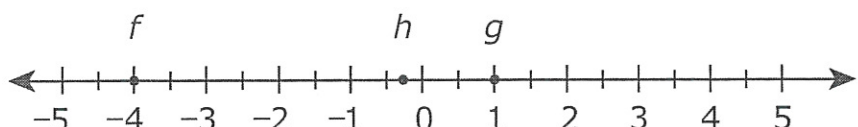
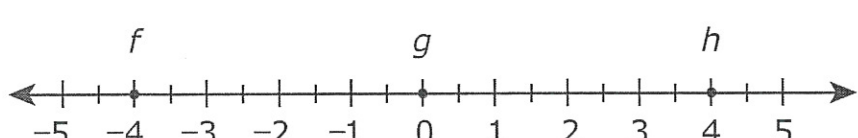
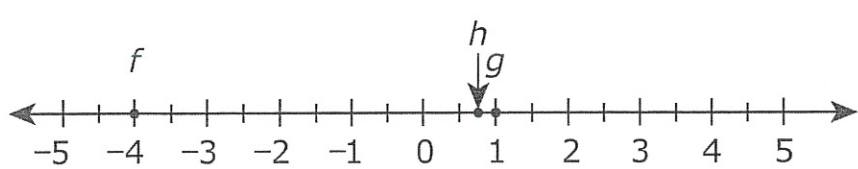
- (A) For every 5 students, there is 1 marker.
- (B) For every 4 students, there is 1 marker.
- (C) For each student, there are 4 markers.
- (D) For each student, there are 5 markers.

Students $\frac{25-5}{100} = \frac{20}{100}$
marker $\frac{1}{100}$ = $\frac{1}{100}$
Simplify!

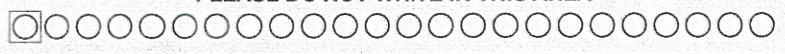
2. Three values on a number line are labeled f , g , and h .

$f = -4$
 $g = -g \rightarrow$ They cancel each other out! 0
 $h = -f \rightarrow$ Opposite of f ! +4

Which number line correctly shows the values of f , g , and h ? *Oh my word!*

- (A) 
- (B) 
- (C) 
- (D) 

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3. 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) $8\frac{7}{16}$

$$A = lw$$

$$5\frac{5}{8} = 1\frac{1}{2}w$$

* Convert to improper fractions!

$$\frac{2}{3} \left(\frac{45}{8} \right) = \left(\frac{3}{2} w \right) \frac{2}{3}$$

$$\frac{90}{24} = w$$

Simplify!

$$3\frac{18}{24} = w$$

Simplify more!

$$3\frac{3}{4} = w$$

5. 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?

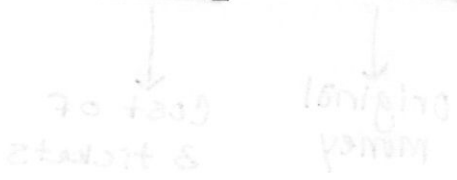
- (A) $36.75 - (3 + x)$
(B) $36.75x - 3$
(C) $36.75(3) - x$
(D) $36.75 - 3x$

$$\begin{array}{ccc} \boxed{36.75} & - & \boxed{3x} \\ \downarrow & & \downarrow \\ \text{original} & & \text{cost of} \\ \text{money} & & \text{3 tickets} \end{array}$$





Unit 1 - Section 2 (Calculator)



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



6. Which expression represents "6 more than x"?

- (A) $x - 6$
- (B) $6 \cdot x$
- (C) $x + 6$
- (D) $6 - x$

7. Evaluate $5x^2 - 4$ when $x = 3$.

Enter your answer in the box.

-					
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	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

$$\begin{aligned}
 &5x^2 - 4 \\
 &5(3)^2 - 4 \\
 &5(9) - 4 \\
 &45 - 4 \\
 &41
 \end{aligned}$$

8. 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) $x > 4$

$$\begin{aligned}
 &x \text{ greater than } 1 \\
 &x > 1
 \end{aligned}$$





Use the information provided to answer Part A and Part B for question 9.

The ratio of the sales tax to the amount of a purchase is a fixed number in Town Q. The table shows the sales tax for a purchase of \$1,200.

Town Q Tax

Purchase	Sales Tax
\$1,200	\$72
\$2,500	?
?	\$108

9. Part A

What is the sales tax for a purchase of \$2,500?

- (A) \$18.06
- (B) \$34.72
- (C) \$144.00
- (D) \$150.00

$$\frac{\text{purchase}}{\text{sales tax}} = \frac{1200}{72} = \frac{2500}{x}$$

$$72(2500) = 1200x$$

$$\frac{180,000}{1,200} = \frac{1,200x}{1,200}$$

$$150 = x$$

Part B

What is the cost of an item with a sales tax of \$108?

- (A) \$432
- (B) \$648
- (C) \$1,092
- (D) \$1,800

$$\frac{\text{purchase}}{\text{Sales tax}} = \frac{1200}{72} = \frac{x}{108}$$

$$72x = 1200(108)$$

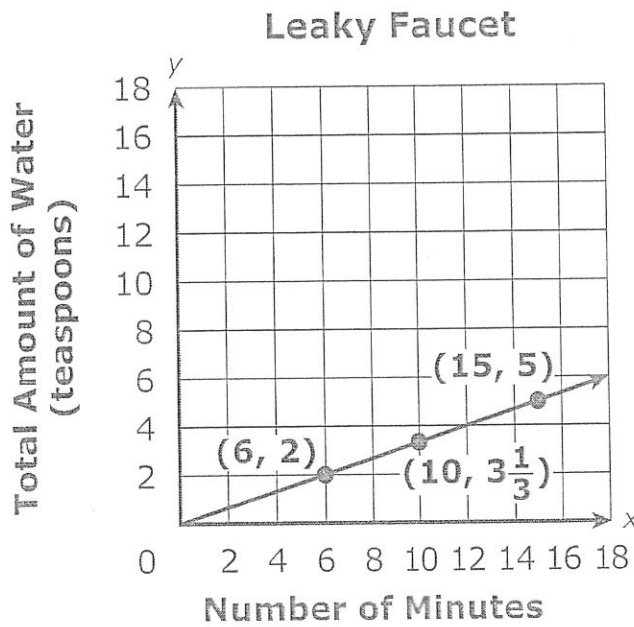
$$\frac{72x}{72} = \frac{129600}{72}$$

$$x = 1800$$



Use the information provided to answer Part A and Part B for question 10.

The graph shows the number of teaspoons of water, y , that have dripped from a leaky faucet at the end of x minutes.



* Make a function table from the ordered pairs!

x	$x \div 3$	y
6	$\div 3$	$= 2$
15	$\div 3$	$= 5$
10	$\div 3$	$= 3\frac{1}{3}$

10. Part A

Which equation represents the relationship between x and y shown in the graph?

(A) $y = 3x$

(B) $y = x - 3$

(C) $y = \frac{1}{3}x$

(D) $y = x + 3$

$x \div 3 = y$

same as

$x(\frac{1}{3}) = y$



**Part B**

Based on the relationship shown in the graph, how many teaspoons of water will have dripped from the faucet at the end of 21 minutes?

Enter your answer in the space provided.

(Minutes, teaspoons)
X Y

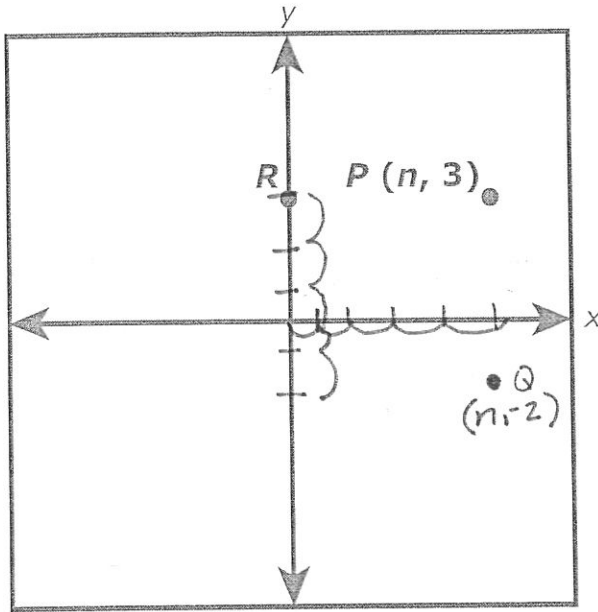
X		Y
6	$\div 3$	2
15	$\div 3$	5
10	$\div 3$	$3\frac{1}{3}$
21	$\div 3$	7

* Function table
from Part A!

21 minutes will drip 7 teaspoons.



11. 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.

• distance P to Q = 5 units

• value of n = 5

see the graph!





12. 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 <i>About 204,000</i>
2	225,624 <i>About 226,000</i>
3	237,108 <i>About 237,000</i>

- The company expects sales of yellow golf balls to continue to increase in year 4. *Make table with row for 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. $\frac{\text{yellow}}{\text{white}} = \frac{1}{5}$
- The average selling price of a box of 12 yellow or 12 white golf balls is \$23.94. *(About \$24.00)*

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.

Year	# of yellow		<u>Year 4</u>	
1	204,000	} +22,000 } +11,000 } +15,000	$\frac{\text{yellow}}{\text{white}} = \frac{1}{5} = \frac{252,000}{x}$	
2	226,000		$5(252,000) = 1x$	$\$2,520,000$
3	237,000		$1,260,000 = x$	+ $\$504,000$
4	252,000		White golf balls	<hr style="border: none; border-top: 1px solid black; margin-bottom: 5px;"/> $\$3,024,000$

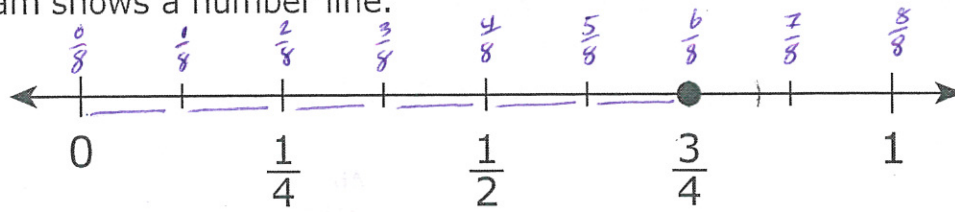
White Golf balls $\rightarrow 1,260,000 \div 12 = (105,000)(\$24) = \cancel{\$2,520,000}$

Yellow Golf balls $\rightarrow 252,000 \div 12 = (21,000)(\$24) = \$504,000$



Use the information provided to answer Part A and Part B for question 13.

This diagram shows a number line.



13. 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.

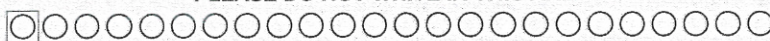
How many pieces can James cut from the board? Explain how James can use the number line diagram to determine the number of pieces he can cut from the board.

Enter your answer and your explanation in the space provided.

James can cut 6 pieces.

** Label the number line in $\frac{1}{8}$'s.*

- Each $\frac{1}{8}$ piece on the number line is a $\frac{1}{8}$ ft. piece.





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.

$$\frac{3}{4} \div \frac{1}{8} = P$$

↓ ↓ ↓

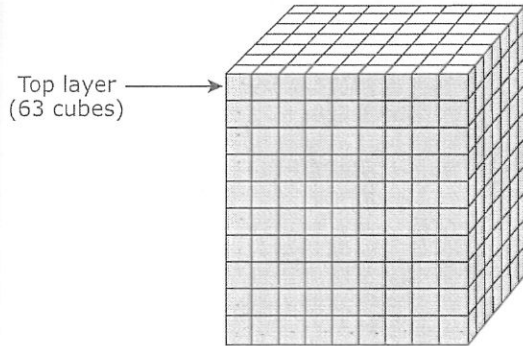
original size # of
board of pieces



Use the information provided to answer Part A and Part B for question 14.

A student filled a right rectangular prism-shaped box with one inch cubes to find the volume, in cubic inches. The student's work is shown.

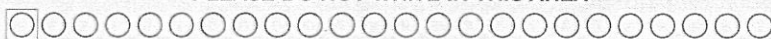
Box Filled with Cubes



Student's Work

- I packed my box full of cubes. Each cube has a volume of 1 cubic inch.
- I counted 63 cubes in the top layer.
- Since there are 9 layers of cubes below the top layer, I solved $63 \times 9 = 567$. So there are 567 cubes.
- The volume of my box is 567 cubic inches.

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**Part B**

A second box also has a base area of 63 square inches, but it has a volume of 756 cubic inches.

What is the height, in inches, of the second box? Explain or show how you determined the height.

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

$$V = lwh$$

$$\text{height} = 12 \text{ in.}$$

$$756 = (7)(9)h$$

$$\frac{756}{63} = \frac{63h}{63}$$

$$12 = h$$



**14. Part A**

Explain why the student's reasoning is incorrect. Provide the correct volume, in cubic inches, of the box.

Enter your explanation and the correct volume in the space provided.

Why incorrect

- There are not 9 layers.
There are 10 layers!

Correct volume

$$\begin{aligned} - V &= lwh \\ &= (9)(7)(10) \\ &= 630 \text{ in.}^3 \end{aligned}$$

**15. Part A**

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

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

Two Steps!

Step 1 Get total trail mix!

$$\begin{array}{c} (8) \\ \text{bags} \end{array} \begin{array}{c} (3\frac{1}{2}) \\ \text{cups} \\ \text{per} \\ \text{bag} \end{array} = 28 \text{ cups total}$$

Step 2 Split trail mix by 12!

$$\frac{28}{12} = 2\frac{1}{3}$$

Each hiker gets $2\frac{1}{3}$ cups of trail mix!



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 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.

Total Distance

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

Trip there Trip back

$$2 + 1\frac{3}{4} + 3\frac{1}{4}$$

Total miles hiked

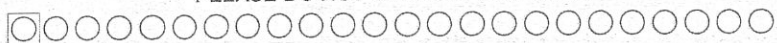
7 miles hiked total!

Water with each hiker

1 hiker

$$(7 \text{ miles}) \left(\frac{1}{4} \text{ gallon} \right) = \frac{7}{4} = 1\frac{3}{4}$$

gallons brought by each hiker.





16. 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 answer and your explanation or process in the space provided.

Try Brianna's way out!

A $9x - 3x - 4$
 $9(0) - 3(0) - 4$
 $0 - 0 - 4$
 -4

B $12x - 4$
 $12(0) - 4$
 $0 - 4$
 -4

C $5x + x - 4$
 $5(0) + (0) - 4$
 $0 + 0 - 4$
 -4

Try with #1!

$9(1) - 3(1) - 4$
 $9 - 3 - 4$
 $6 - 4$
 2

$12(1) - 4$
 $12 - 4$
 8

$5(1) + (1) - 4$
 $5 + 1 - 4$
 $6 - 4$
 2

**Never use zero! It is too extreme and doesn't follow the rules. Special case. A and C are equivalent. Use more than 1 sample number!*



17. 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.

Ratios!

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

Small Fish
200 gallons

$$\frac{\text{fish}}{\text{gal}} \frac{5}{10} = \frac{x}{200}$$

$$5(200) = 10x$$

$$\frac{1000}{10} = \frac{10x}{10}$$

$$100 = x$$

He can have 100 small fish.

Big Fish
200 gallons

$$\frac{\text{fish}}{\text{gal}} \frac{8}{40} = \frac{x}{200}$$

$$8(200) = 40x$$

$$\frac{1600}{40} = \frac{40x}{40}$$

$$40 = x$$

He can have 40 big fish.

* Total Fish = 100 small + 40 big = 140 fish

* Ratio $\frac{\text{small fish}}{\text{large fish}} = \frac{100}{40}$ or $\frac{5}{2}$

For every 5 small fish he can get 2 big fish.

