



Grade **6**

# **GEORGIA**

# **Math**

# **GMAS Practice**

**Updated for 2021-22**



**2 GMAS Practice Tests**  
**7 Question Types**

**COVERS 30+ SKILLS**

# Important Instruction

Students, Parents, and Teachers can use the URL or QR code provided below to access two full-length Lumos GMAS practice tests. Please note that these assessments are provided in the Online format only.

URL
Visit the URL below and place the book access code <b><a href="http://www.lumoslearning.com/a/tedbooks">http://www.lumoslearning.com/a/tedbooks</a></b> <b>Access Code: xxxx-xxxx</b>

**This is a sample copy and not the full  
version of the workbook**

# INTRODUCTION

This book is specifically designed to improve student achievement on the Smarter Balanced Assessment Consortium (GMAS) Test. With over a decade of expertise in developing practice resources for standardized tests, Lumos Learning has designed the most efficient methodology to help students succeed on the state assessments (See Figure 1).

Lumos Smart Test Practice provides students GMAS assessment rehearsal along with an efficient pathway to overcome any standards proficiency gaps. Students perform at their best on standardized tests when they feel comfortable with the test content as well as the test format. Lumos online practice tests are meticulously designed to mirror the GMAS assessment. It adheres to the guidelines provided by the GMAS for the number of questions, standards, difficulty level, sessions, question types, and duration.

The process starts with students taking the online diagnostic assessment. This online diagnostic test will help assess students' proficiency levels in various standards.

After completion of the diagnostic assessment, students can take note of standards where they are not proficient. This step will help parents and educators in developing a targeted remedial study plan based on a student's proficiency gaps.

Once the targeted remedial study plan is in place, students can start practicing the lessons in this workbook that are focused on specific standards.

After the student completes the targeted remedial practice, the student should attempt the second online GMAS practice test. Record the proficiency levels in the second practice test to measure the student progress and identify any additional learning gaps. Further targeted practice can be planned

## Lumos Smart Test Prep Methodology

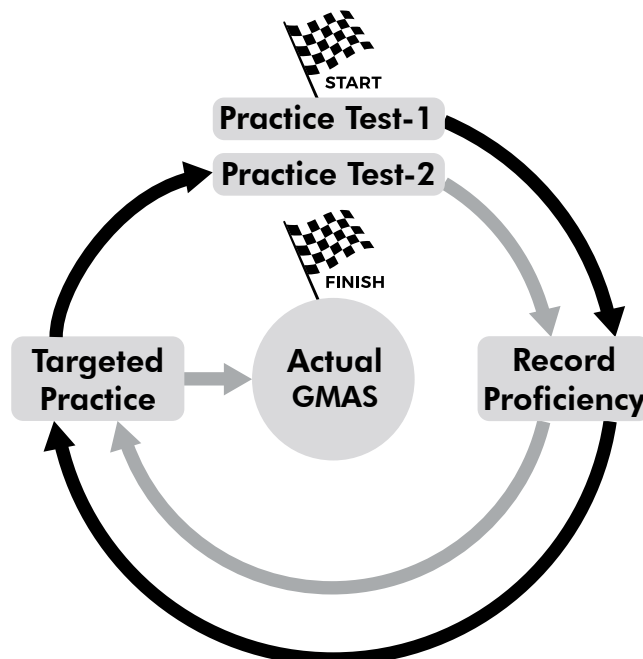


Figure 1

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# Chapter 1

## Lumos Smart Test Prep Methodology

### Step 1: Access Online GMAS Practice Test

Use the URL and access code provided below or scan the QR code to access the first GMAS practice test to get started. The online GMAS practice test mirrors the actual Smarter Balanced assessments in number of questions, item types, test duration, test tools and more.

After completing the test, your student will receive immediate feedback with detailed reports on standards mastery. With this report, use the next section of the book to design a practice plan for your student.

#### URL

Visit the URL below and place the book access code

**<http://www.lumoslearning.com/a/tedbooks>**

**Access Code: xxxxx-xxxxx-x**

## Step 2: Review the Personalized Study Plan Online

After student complete the online Practice Test 1, student can access their individualized study plan from the table of contents (Figure 2).

Parents and Teachers can also review the study plan through their Lumos account.

Lumos StepUp GMAS Online Practice and Assessments Grade 6 Math						
HOMEWORK						
Lesson Name	Total Questions	Total Points	Incorrect	Student Score	% Score	Pending
PT1 Practice Test I	4	4	3	1	25%	0
CAT I	4	4	3	1	25%	
PT I						

Study Plan

BACK COURSE

**GEORGIA Math GMAS Practice**

Updated for 2021-22

2 GMAS Practice Tests

7 Question Types

ONLINE

COVERS 30+ SKILLS

**Lumos StepUp - GMAS Online Practice and Assessments - Grade 6 Math**

Based on your performance in the online Practice Test 1, we recommend the following additional practice. Please use the related lessons in the Grade 6 GMAS Math practice book you purchased.

Upgrade to Full Program

50 90

EXPORT AS EXCEL

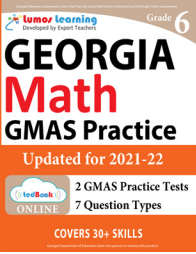
Lesson Name	Standard Info	<input type="checkbox"/> Targeted practice status	Percentage Score
<b>Ratios and Proportional Relationships</b>			
Expressing Ratios	6.RP.A.1	<input type="checkbox"/>	0%
Unit Rates	6.RP.A.2	<input type="checkbox"/>	0%
Solving Real World Ratio Problems	6.RP.A.3	<input type="checkbox"/>	0%

## Step 3: Complete Targeted Practice

Using the information provided in the study plan report, complete the targeted practice using the appropriate lessons to overcome proficiency gaps. With lesson names included in the study plan, find the appropriate topics in this workbook and answer the questions provided. Students can refer to the answer key and detailed answers provided for each lesson to gain further understanding of the learning objective. Marking the completed lessons in the study plan after each practice session is recommended. (See Figure 3)

**BACK COURSE**

Lumos Smart Test Practice: Personalized Study Plan for Sam




**GEORGIA Math**  
GMAS Practice  
Updated for 2021-22  
2 GMAS Practice Tests  
7 Question Types  
COVERS 30+ SKILLS

Lumos StepUp - GMAS Online Practice and Assessments - Grade 6 Math

Upgrade to Full Program

Based on your performance in the online Practice Test 1, we recommend the following additional practice. Please use the related lessons in the Grade 6 GMAS Math practice book you purchased.

50 90

  
EXPORT AS EXCEL

Lesson Name	Standard Info	<input type="checkbox"/> Targeted practice status	Percentage Score
<b>Ratios and Proportional Relationships</b>			
Expressing Ratios	6.RP.A.1	<input checked="" type="checkbox"/>	0%
Unit Rates	6.RP.A.2	<input checked="" type="checkbox"/>	0%
Solving Real World Ratio Problems	6.RP.A.3	<input type="checkbox"/>	0%

Figure 3

## Step 4: Access the Practice Test 2 Online

After completing the targeted practice in this workbook, students should attempt the second GMAS practice test online. Using the student login name and password, login to the Lumos website to complete the second practice test.

## Step 5: Repeat Targeted Practice

Repeat the targeted practice as per Step 3 using the second study plan report for Practice test 2 after completion of the second GMAS rehearsal.





Name: \_\_\_\_\_

Date: \_\_\_\_\_

# Chapter 2:

## Ratios & Proportional Relationships

### Lesson 1: Expressing Ratios

You can scan the QR code given below or use the url to access additional EdSearch resources including videos and mobile apps related to *Expressing Ratios*.

**Categories**

About 13 results (0.009 seconds)

☐ Pin (5)

☐ Questions (4)


☐ Videos (2)

☐ Free Lessons (1)

☐ Khan Academy (1)

Popular Searches ▼

**Basic ratios**





Resource: Khan Academy  
Standard: 6.RP.A.1  
Grade: 6  
Subject: Math

Topic

Standard

+

 **Expressing Ratios**

URL	QR Code
<a href="http://www.lumoslearning.com/a/6rpa1">http://www.lumoslearning.com/a/6rpa1</a>	



1. A school has an enrollment of 600 students. 330 of the students are girls. Express the fraction of students who are boys in simplest terms.

(A)  $\frac{12}{20}$

(B)  $\frac{11}{20}$

(C)  $\frac{9}{20}$

(D)  $\frac{13}{20}$

2. In the 14th century, the Sultan of Brunei noticed that his ratio of emeralds to rubies was the same as the ratio of diamonds to pearls. If he had 85 emeralds, 119 rubies, and 45 diamonds, how many pearls did he have?

(A) 17

(B) 22

(C) 58

(D) 63

3. Mr. Fullingham has 75 geese and 125 turkeys. What is the ratio of the number of geese to the total number of birds in simplest terms?

(A) 75:200

(B) 3:8

(C) 125:200

(D) 5:8

4. The little league team called the Hawks has 7 brunettes, 5 blonds, and 2 redheads. What is the ratio of redheads to the entire team in simplest terms?

(A) 2:7

(B) 2:5

(C) 2:12

(D) 1:7



Name: \_\_\_\_\_

Date: \_\_\_\_\_

5. The little league team called the Hawks has 7 brunettes, 5 blonds, and 2 redheads. The entire little league division that the Hawks belong to has the same ratio of redheads to everyone else. What is the total number of redheads in that division if the total number of players is 126?
- (A) 9  
(B) 14  
(C) 18  
(D) 24
6. Barnaby decided to count the number of ducks and geese flying south for the winter. The first day he counted 175 ducks and 63 geese. What is the ratio of ducks to the total number of birds flying overhead in simplest terms?
- (A) 175:63  
(B) 175:238  
(C) 25:9  
(D) 25:34
7. Barnaby decided to count the number of ducks and geese flying south for the winter. The first day he counted 175 ducks and 63 geese. By the end of migration, Barnaby had counted 4,725 geese. If the ratio of ducks to geese remained the same (175 to 63), how many ducks did he count?
- (A) 13,125  
(B) 17,850  
(C) 10,695  
(D) 14,750
8. Barbara was baking a cake and could not find her tablespoon measure. The recipe calls for  $3\frac{1}{3}$  tablespoons. Each table spoon measure 3 teaspoon. How many teaspoons must Barbara use in order to have the recipe turn out all right?
- (A) 3  
(B) 6  
(C) 9  
(D) 10
9. The ratio of girls to boys in a grade is 6 to 5. If there are 24 girls in the grade then how many students are there altogether?
- (A) 14  
(B) 24  
(C) 34  
(D) 44

Name: \_\_\_\_\_

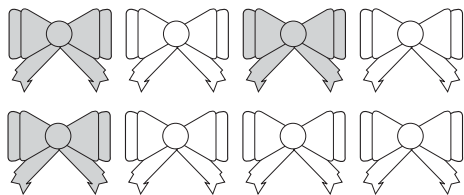
Date: \_\_\_\_\_



**10. The ratio of pencils to pens in a box is 3 to 2. If there are 30 pencils and pens altogether, how many pencils are there?**

- Ⓐ 16
- Ⓑ 17
- Ⓒ 18
- Ⓓ 19

**11. Which of the following correctly expresses the ratio of shaded bows to the number of total bows? Select all answers that apply.**



- Ⓐ 3:8
- Ⓑ 5:8
- Ⓒ  $\frac{3}{5}$
- Ⓓ  $\frac{3}{8}$
- Ⓔ  $\frac{5}{8}$

**12. Write the ratio that correctly describes the number of white stars compared to the number of gray stars. Write your answer in the box below.**





Name: \_\_\_\_\_

Date: \_\_\_\_\_

13. Complete the following table by filling in the blanks with a number that shows the correct ratio that is equivalent to the one shown in the first row.

1	2
2	4
	6
4	8
5	
	12

Name: \_\_\_\_\_

Date: \_\_\_\_\_



# **Chapter 2:**

## **Ratios & Proportional Relationships**

### **Answer Key & Detailed Explanations**



Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Lesson 1: Expressing Ratios

Question No.	Answer	Detailed Explanations
1	C	First, to find the proper ratio, subtract the number of girls from the total number of students. The difference is the number of boys. $600 - 330 = 270$ . So, the initial ratio is $\frac{270}{600}$ . Then, to rewrite a ratio in its simplest terms, divide the numerator and denominator by the Greatest Common Factor (GCF). Here, the GCF is 30. $270$ divided by $30 = 9$ and $600$ divided by $30 = 20$ , so, the simplest ratio is $\frac{9}{20}$ .
2	D	First, find the ratio of emeralds to rubies. That ratio is $\frac{85}{119}$ . To find how many pearls the sultan had, set up a proportion with the ratio of diamonds to pearls: $\frac{85}{119} = \frac{45}{x}$ Then, find the cross products of each: $85 * x = 119 * 45$ Simplify: $85x = 5355$ Solve for $x$ by dividing by $85$ on both sides: $\frac{85x}{85} = \frac{5355}{85}$ $x = 63$
3	B	$75 + 125 = 200$ . Therefore, the total number of birds is $200$ . The ratio of geese to total birds is $75:200$ . Simplify the ratio by dividing by the GCF ( $75, 200$ ) = $25$ , simplified ratio is $3:8$ .
4	D	There are $(7+5+2) = 14$ players in all. The ratio of redheads to the team is $2:14$ . Divide by the GCF of $2$ to simplify the ratio to $1:7$
5	C	Set up the proportion: $\frac{2}{14} = \frac{x}{126}$ , $\frac{1}{7} = \frac{x}{126}$ , cross multiply to get $7x = 126$ , then divide by $7$ and $x = 18$ .
6	D	The total number of birds is $175 + 63 = 238$ . Thus, the ratio of ducks to total birds is $175:238$ . To find the ratio in simplest terms, divide by the GCF( $175, 238$ ) = $7$ . The ratio in simplest terms is $25:34$ .
7	A	The ratio of ducks to geese is $175:63$ . To find how many ducks, set up a proportion of $\frac{175}{63} = \frac{x}{4,725}$ . Find the cross products: $175 * 4,725 = 63 * x$ $826,875 = 63x$ Divide both sides by $63$ $x = 13,125$
8	D	There are $3$ teaspoons to each tablespoon. Thus $3 * \frac{10}{3} = 10$ teaspoons.



Question No.	Answer	Detailed Explanations												
9	D	To find how many students there are in the grade, set up the proportion $\frac{6}{5} = \frac{24}{x}$ . Notice that you can multiply $\frac{6}{5}$ by $\frac{4}{4}$ to make the numerator of 24. This makes the equivalent denominator 20. Add $24 + 20$ to get the total number of students, or 44.												
10	C	If the ratio of pencils to pens is $\frac{3}{2}$ then the ratio of pencils to pencils and pens is $\frac{3}{5}$ . To find the number of pencils in a box with 30 pencils and pens, set up the proportion $\frac{3}{5} = \frac{x}{30}$ . Then, multiply the first ratio by $\frac{6}{6}$ which will equal $\frac{18}{30}$ . There are 18 pencils in the box.												
11	A & D	Correct Response: 3:8 and $\frac{3}{8}$ There are 3 shaded bows and a total of 8 bows in all. 3:8 is the correct way to write a ratio or it can be written $\frac{3}{8}$ , which is read "3 out of 8".												
12	4:5	4:5. There are 4 white stars and 5 gray stars.												
13		<table><tr><td>1</td><td>2</td></tr><tr><td>2</td><td>4</td></tr><tr><td>3</td><td>6</td></tr><tr><td>4</td><td>8</td></tr><tr><td>5</td><td>10</td></tr><tr><td>6</td><td>12</td></tr></table> <p>The numbers are 3, 6, 10. The first row shows the ratio pattern, which is 1:2, which means each number in the left column is <math>\frac{1}{2}</math> of the number in the right column.</p>	1	2	2	4	3	6	4	8	5	10	6	12
1	2													
2	4													
3	6													
4	8													
5	10													
6	12													





Name: \_\_\_\_\_

Date: \_\_\_\_\_

# Chapter 3:

## The Number System

### Lesson 1: Division of Fractions

You can scan the QR code given below or use the url to access additional EdSearch resources including videos and mobile apps related to *Division of Fractions*.

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**Dividing Fractions and Mixed Numbers: 6.NS.A.1**  
Resource: Pin

 **Division of Fractions**

URL	QR Code
<a href="http://www.lumoslearning.com/a/6nsa1">http://www.lumoslearning.com/a/6nsa1</a>	

Name: \_\_\_\_\_

Date: \_\_\_\_\_



1. What is the quotient of 20 divided by one-fourth?

- Ⓐ 80
- Ⓑ 24
- Ⓒ 5
- Ⓓ 15

2. Calculate:  $1\frac{1}{2} \div \frac{3}{4} =$

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

3. Calculate:  $3\frac{2}{3} \div 2\frac{1}{6} =$

- Ⓐ  $\frac{8}{13}$
- Ⓑ  $\frac{12}{13}$
- Ⓒ  $1\frac{5}{13}$
- Ⓓ  $1\frac{9}{13}$

4. Calculate:  $2\frac{3}{4} \div \frac{11}{4} =$

- Ⓐ 1
- Ⓑ 2
- Ⓒ 3
- Ⓓ 4



Name: \_\_\_\_\_

Date: \_\_\_\_\_

5. Calculate:  $\frac{7}{8} \div \frac{3}{4} =$

(A)  $1\frac{1}{6}$

(B) 2

(C)  $\frac{21}{32}$

(D)  $\frac{5}{9}$

6. Calculate:  $6\frac{3}{4} \div 1\frac{1}{8} =$

(A)  $\frac{1}{6}$

(B) 4

(C)  $5\frac{3}{4}$

(D) 6

7. Complete the following division using mental math.

7 divided by  $\frac{1}{5}$

(A) 35

(B)  $\frac{7}{5}$

(C)  $\frac{5}{7}$

(D)  $\frac{1}{35}$

**8. Complete the following division using mental math.**11 divided by  $\frac{6}{6}$ 

- Ⓐ  $\frac{66}{66}$
- Ⓑ  $\frac{1}{11}$
- Ⓒ 1
- Ⓓ 11

**9. What is the result when a fraction is multiplied by its reciprocal?**

- Ⓐ  $\frac{1}{2}$
- Ⓑ 10
- Ⓒ 1
- Ⓓ It cannot be determined.

**10. Simplify the following problem. Do not solve.**

$$\frac{14}{21} \div \frac{28}{7}$$

- Ⓐ  $\frac{14}{21} \div \frac{28}{7}$
- Ⓑ  $\frac{2}{3} \times \frac{1}{4}$
- Ⓒ 1
- Ⓓ 10



Name: \_\_\_\_\_

Date: \_\_\_\_\_

**11. Which of the following is equal to  $1 \div \frac{3}{4}$ ? Circle the correct answer choice.**

Ⓐ  $\frac{4}{3}$

Ⓑ  $\frac{2}{4}$

Ⓒ  $\frac{1}{3}$

**12. Fill in the blank.**

$$\frac{1}{2} \div 4 = \underline{\hspace{1cm}}?$$

**13. Which of the following is equal to  $\frac{7}{2} \div \frac{2}{6}$ ? Circle the correct answer choice.**

Ⓐ  $\frac{9}{2}$

Ⓑ  $\frac{5}{4}$

Ⓒ  $\frac{42}{4}$

Name: \_\_\_\_\_

Date: \_\_\_\_\_



## **Chapter 3: The Number System**

### **Answer Key & Detailed Explanations**



Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Lesson 1: Division of Fractions

Question No.	Answer	Detailed Explanations
1	A	<p>The original problem is:</p> $\frac{20}{1} \div \frac{1}{4} =$ <p>To divide fractions, you must Keep (the first fraction), Change (the division to multiplication), and Flip (the second fraction, or, take the reciprocal).</p> $\frac{20}{1} \times \frac{4}{1} = \frac{80}{1} = 80$
2	D	<p>The original problem is:</p> $1\frac{1}{2} \div \frac{3}{4} =$ <p>First, find the improper fraction of the first mixed number (numerator = bottom times the side plus the top) = <math>[(2*1)+1]</math>, Fraction = <math>\frac{3}{2}</math></p> <p>To divide fractions, you must keep (the first fraction), Change (the division to multiplication), Flip (the second fraction, or, take the reciprocal).</p> $\frac{3}{2} \times \frac{4}{3} = \frac{12}{6}$ <p>Simplify by factoring out the GCF of 6. The answer is <math>\frac{2}{1}</math> or 2</p>
3	D	<p>The original problem is:</p> $3\frac{2}{3} \div 2\frac{1}{6} =$ <p>First, find the improper fraction of the first mixed number (numerator = bottom times the side plus the top) = <math>[(3*3)+2]</math>, Fraction = <math>\frac{11}{3}</math></p> <p>. Then, find the improper fraction of the second mixed number (numerator = bottom times the side plus the top = <math>[(2*6)+1]</math>, Fraction = <math>\frac{13}{6}</math></p> <p>To divide fractions, you must keep (the first fraction), Change (the division to multiplication), Flip (the second fraction, or, take the reciprocal).</p> $\frac{11}{3} \times \frac{6}{13} = \frac{66}{39}$ <p>Simplify by factoring out the GCF of 3.</p> <p>The answer is <math>\frac{22}{13}</math></p> <p>Divide <math>\frac{22}{13}</math> to get a mixed number: The answer is <math>1\frac{9}{13}</math>.</p>



Question No.	Answer	Detailed Explanation
4	A	<p>The original problem is:</p> $2\frac{3}{4} \div \frac{11}{4} =$ <p>First convert the mixed fraction into improper fraction by using            Numerator of the improper fraction = denominator of mixed fraction            x whole part of the mixed fraction + numerator of the mixed fraction            whereas the denominator of the improper fraction is same as that of            the mixed fraction.</p> $2\frac{3}{4} \div \frac{11}{4} = \frac{11}{4} \div \frac{11}{4} = 1$
5	A	<p>The original problem is:</p> $\frac{7}{8} \div \frac{3}{4} =$ <p>Division of fractions can be obtained by multiplying the dividend with            the reciprocal of the divisor.</p> <p>Thus, <math>\frac{7}{8} \div \frac{3}{4} = \frac{7}{8} \times \frac{4}{3} = \frac{28}{24} = \frac{7}{6} = 1\frac{1}{6}</math></p>
6	D	<p>The original problem is:</p> $6\frac{3}{4} \div 1\frac{1}{8} =$ <p>First convert the mixed fractions into improper fraction by using            Numerator of the improper fraction = denominator of mixed fraction            x whole part of the mixed fraction + numerator of the mixed fraction            whereas the denominator of the improper fraction is same as that of            the mixed fraction.</p> <p>So, <math>6\frac{3}{4} \div 1\frac{1}{8} = \frac{27}{4} \div \frac{8}{9}</math></p> <p>Division of fractions can be obtained by multiplying the dividend with            the reciprocal of the divisor.</p> <p>Thus, <math>\frac{27}{4} \div \frac{8}{9} = \frac{27}{4} \times \frac{9}{8}</math></p> <p>Cross factor out the GCF of 4 and 8            Cross factor out the GCF of 9 from 9 and 27</p> $\frac{3}{1} \times \frac{2}{1} = 6$





Name: \_\_\_\_\_

Date: \_\_\_\_\_

Question No.	Answer	Detailed Explanation
7	A	To divide the fractions, you must Keep (the first fraction), Change (the division to multiplication), and Flip (the second fraction, or, take the reciprocal).  The second fraction then reads $\frac{5}{1}$ . Because $\frac{5}{1}$ is the same as 5, the problem simplifies to $7 \times 5 = 35$ .
8	D	Since $\frac{6}{6}$ is equal to 1, the problem simplifies to 11 divided by 1. The answer is 11.
9	C	When any fraction is multiplied by its reciprocal, the cross numerators and denominators will always factor to 1.
10	B	$\frac{14}{21} \div \frac{28}{7}$ Becomes $\frac{14}{21} \times \frac{7}{28}$ After Keep–Change–Flip. Then, cross factor out a GCF of 7 from the 14 and 21, and a GCF of 7 from the 7 and 28. The simplified problem becomes: $\frac{2}{3} \times \frac{1}{4}$
11	A	$\frac{4}{3}$ . Because $1 \div \frac{3}{4} = \frac{1}{1} \times \frac{4}{3} = \frac{4}{3}$
12	$\frac{1}{8}$	$\frac{1}{8}$ . Because $\frac{1}{2} \div \frac{4}{1} = \frac{1}{2} \times \frac{1}{4} = \frac{1}{8}$
13	C	$\frac{42}{4}$ . Because $\frac{7}{2} \div \frac{2}{6} = \frac{7}{2} \times \frac{6}{2} = \frac{42}{4}$

Name: \_\_\_\_\_

Date: \_\_\_\_\_



# Chapter 4:

## Expressions & Equations

### Lesson 1: Whole Number Exponents

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## *Whole Number Exponents*

URL

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<http://www.lumoslearning.com/a/6eea1>





Name: \_\_\_\_\_

Date: \_\_\_\_\_

1. Evaluate:  $5^3$

- Ⓐ 15
- Ⓑ 125
- Ⓒ 8
- Ⓓ 2

2. Write the expression using an exponent:  $2 * 2 * 2 * 2 * 2 * 2$

- Ⓐ  $2 * 6$
- Ⓑ 12
- Ⓒ  $2^6$
- Ⓓ  $6^2$

3. Write the expression using an exponent:  $y * y * y * y$

- Ⓐ  $4y$
- Ⓑ  $y/4$
- Ⓒ  $4^y$
- Ⓓ  $y^4$

4. Find the numerical value of the following expression:  $11^1$

- Ⓐ 11
- Ⓑ 1
- Ⓒ 12
- Ⓓ 10

5. Write an expression using exponents:  $2 * 2 * m * m$

- Ⓐ  $2(2m)$
- Ⓑ  $4m$
- Ⓒ  $2^2m^2$
- Ⓓ  $2/m$

6. Simplify:  $4^3 * 4^2$

- Ⓐ 20
- Ⓑ 9
- Ⓒ  $4^5$
- Ⓓ 20



7. Simplify:  $(b^2c)(bc^3)$

- Ⓐ  $3b/4$
- Ⓑ  $3b * 4$
- Ⓒ  $b^3c^4$
- Ⓓ  $bc$

8. Simplify:  $(n^4x^2)^3$

- Ⓐ  $12n*6x$
- Ⓑ  $n^{12}x^6$
- Ⓒ  $n^{43}x^{23}$
- Ⓓ  $n^7x^5$

9. Simplify:  $7^4/7^2$

- Ⓐ  $7^6$
- Ⓑ  $7^3$
- Ⓒ  $7^2$
- Ⓓ  $7^4$

10. Simplify:  $[(3^5)(3^2)]^4$

- Ⓐ  $3^{28}$
- Ⓑ  $3^{40}$
- Ⓒ  $3^{10}$
- Ⓓ  $3^{11}$

11. Select all numbers that would have a total value greater than 50.

- Ⓐ  $6^2$
- Ⓑ  $2^3$
- Ⓒ  $5^2$
- Ⓓ  $10^2$
- Ⓔ  $4^4$

12. Find the numerical value of  $8^4$ . Write your answer in standard form in the box.



Name: \_\_\_\_\_

Date: \_\_\_\_\_

## **Chapter 4: Expressions & Equations**

### **Answer Key & Detailed Explanations**



## Lesson 1: Whole Number Exponents

Question No.	Answer	Detailed Explanation
1	B	The base is 5. The exponent is 3. 5 is multiplied 3 times, or $5 \times 5 \times 5 = 125$
2	C	The base is 2. Count the factors. There are 6. 6 is the exponent. $2 * 2 * 2 * 2 * 2 * 2 = 2^6$
3	D	The base is y. Count the factors. There are 4. 4 is the exponent. $y * y * y * y = y^4$
4	A	Write the factors: 11 Since 11 is the only factor, $11^1 = 11$
5	C	$2^2m^2$ The first base is 2. Count the number of 2s. There are 2. 2 is the exponent, so part of the expression is $2^2$ The second base is m. Count the number of ms. There are 2. 2 is the exponent, so part of the expression is $m^2$ The full expression is written as: $2^2m^2$
6	C	$4^3 * 4^2 = 4 * 4 * 4 * 4 * 4 = 4^5$
7	C	We know that $a^m * a^n = a^{(m+n)}$ . Therefore, $(b^2c)(bc^3) = b^3c^4$
8	B	We know that $a^m * a^n = a^{(m+n)}$ . Therefore, $(n^4x^2)^3 = n^{12}x^6$
9	C	We know that $a^m/a^n = a^{(m-n)}$ . Therefore, $7^4/7^2 = 7^2$
10	A	$[(3^5)(3^2)]^4 = 3^{28}$ Keep the base the same. 3 is the base. Add the exponents inside the brackets. $5 + 2 = 7$ . The expression becomes $[3^7]^4$ . To simplify further, multiply the exponents (since the base has a power raised to a power.) $[3^7]^4 = 3^{7*4} = 3^{28}$
11	D & E	D. $10^2 = 10 \times 10 = 100$ E. $4^4 = 4 \times 4 \times 4 \times 4 = 256$
12	4096	$8^4 = 8 \times 8 \times 8 \times 8 = 4,096$

# Progress Chart

Standard	Lesson	Page No.	Practice		Mastered	Re-practice / Reteach
			Date	Score		
<b>CCSS</b>						
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6.R.P.A.2	Unit Rates	15				
6.R.P.A.3	Solving Real World Ratio Problems	19				
6.R.P.A.3.B	Solving Unit Rate Problems	23				
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Standard	Lesson	Page No.	Practice		Mastered	Re-practice /Reteach
			Date	Score		
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