Middle School Math Review (Back-to-School or Summer!)

Grades 7 & 8

6

Includes;

200 Practice Problems & Solutions Study Guide Review Sheets Bookmark Reference Sheet 12 Reference Reviews Vocabulary Word Search Puzzle Learning Reflections Sheets 2 Quizzes and 1 Final Test

12 Topics Covered

Designed by Creative Learning Solutions

MIDDLE SCHOOL MATH RELIEW

<u>Strand</u>: Mathematics <u>Grade</u>: 7 & 8 <u>Time Frame</u>: 14 - 15 42-minute classes <u>Common Core Standards Covered:</u>

- Mathematics:
 - o Grade 6: 6 RPA 1-3; 6 NSA 1-6; 6 EE 1-2; 6 GA 1-2; 6 SPA 1-3
 - o Grade 7: 7 RPA2; 7 NSA 1-3; 7 GB4, 6; 7 SPC 5
 - Grade 8: 8 NSA1; EEA1-2

Materials: Pencil, eraser, and calculator.

12 Topics covered;

- Order of operations
- Operations with fractions
- Operations with rational numbers including absolute value
- The percent proportion
- Exponents
- Perimeter and area
- Area and circumference of circles
- Volume
- Probability and odds
- Measures of central tendency
- The Pythagorean Theorem
- The Coordinate Plane

*The bookmark folds in half vertically and secures with a bit of tape.

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MIDDLE SCHOOL MATH RELIEW

Each day the students will begin with a blank copy of the "Show What You Know" study guide. Students will fill out the day's topic, facts remembered and what they need clarification on (the three top boxes).

During the lesson, students will start with a warm-up discussion (topic questions included) to scaffold learning and students will then complete the notes, vocabulary and example sections to compete the study guide.

Students will receive the reference sheet for that topic; each topic sheet is two-sided and may be attached to the "Show What You Know" study guide. Students may work individually, pairs or groups to complete the review problems. Solutions are included.

Students should remember to show all their steps. Pacing is generally one day per topic. After class or for homework students can complete the "Learning Reflections Sheets" (or as an exit ticket) and the vocabulary word search puzzle.

General Introduction to the Review

Anticipatory Set - Discussion Questions (Hook)

- What topics in math give you difficulties? Explain.
- If you had to pick one thing that gave you the most trouble in math what would it be? Explain.
- What do you remember that you find easy to complete? Explain.
- What topic in your experience is used most often in your everyday life? Explain.
- What are or skill would you most like to improve in? Explain.

<u>Show What You Know!</u>			
Todays topic is how to;			
Facts I remember about this topic; 1. 2. 3. 4. 5.	I would like to know more about; (Use how and why) 1. 2. 3.		
Notes on today's lesson;	rning Solutions 2019		



After completing this topic I know how to ...

I feel I can better . . .

I understand . . .

I would still like to . . .

I feel more confident in . . .

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Learning Reflection Sheet
After completing this topic I know how to
I feel I can better
Tundonatond
I understand
I would still like to
I feel more confident in
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Show What You Know1.
$$\frac{6^2-8}{4(3+7)}$$
7. $5 \cdot 5 - 1 \cdot 3$ 2. $48 \div 2^3 \cdot 3 \div 5$ 8. $6^2 \div 8 \cdot 3 \div 7$ 3. $(8 - 3) \cdot 3(3 \div 2)$ 9. $(4 \div 6)7$ 4. $4[12 \div (6 - 2)]^2$ 10. $50 - (15 \div 9)$ 5. $\frac{7^8 - 6 \cdot 7}{3^3 - 5 \cdot 3 - 2}$ 11. $[8(2) - 4^2] \div 7(4)$

6. $30 - 14 \div 2$ 12. $\frac{11-8}{1+7*2}$

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Order of Operations

Anticipatory Set - Discussion Questions (Hook)

- What do you know/remember about the order of operations?
- Why do you think we need an order of operations?
- How would this affect other topics such as science?
- What if different countries had different accepted orders for performing operations?
- Why is 1 + 1 + 1 + 1 + 1 × 0 and (1 + 1 + 1 + 1 + 1) × 0 different?
 - \circ 1+1+1+1+1×0 MULTIPLICATION first; 1×0=0
 - 1+1+1+1+1+0 become 5+0+5
 AND
 - (1 + 1 + 1 + 1 + 1) × 0 PARENTHESES first
 - **5 x 0 = 0**

Vocabulary:

- Order of Operations: an agreed upon algorithm for solving expressions.
- <u>Grouping symbols</u>; include parentheses, brackets, braces and fractions bars.
- **Evaluate:** to find the value of an expression.

SOLUTIONS

Study Guide Page;	Practice Page
	1. 7/10
1. 14	2. 23
2. 0	3. 75
3. 71	4. 36
4. 31	5. 2
5. 60	6. 23
6. 5/18	7. 22
7. 24	8. 67
8. 47	9. 70
	10. 26
	11. 28
	12.1/5

Operations with Fractions

Anticipatory Set - Discussion Questions (Hook)

- What do you know/remember about working with fractions?
- What makes them difficult?
- When you multiply 4/5 by it's reciprocal what happens?
- How does being familiar with factors of a number help you solve fraction problems?

Vocabulary:

- <u>Greatest Common Factor (GCF)</u>: the product of the prime factors common to two or more numbers.
- <u>Least Common Denominator (LCD)</u>; the least common multiple of the denominators of two or more fractions.
- <u>Prime Number</u>: a whole number, greater than 1, with only factors that are 1 and itself.
- <u>Multiplicative Inverse (Reciprocals)</u>: two numbers that produce a product of 1.

SOLUTIONS

Study Guide Page;	3. 2/9
	4. 13/20
1. 1/16	5. 143/150
2. ³ / ₄	6. 1 1/60
3. $\frac{1}{4}$	7. $\frac{1}{2}$
4. 2/33	8. 3/20
5. 5/2 or 2 ½	9. 9/10
6. 21/10 or 2 1/10	10.11/20
	11. 3
Practice Page;	12.20/17 or 1 3/17
	13.1/8
1. 35/88	14.5/18
2. 1/12	15.1

<u>Operations with Rational Numbers</u>

ADDITION

SAME SIGNS - add and keep the sign DIFFERENT SIGNS - subtract and keep the sign of the number with the greater absolute value

SUBTRACTION

Keep the sign of the first number Change the operation sign Then add

Same signs = positive solutions Different signs = negative solutions

Absolute Value

The number of spaces a digit is from zero on the number line – always positive. Indicated by placing the number between slashed line; /-4/ read as "the absolute value of negative 4".

/-4/ = 4

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- 1. /-3.9/ 6. 16 (-23)
- 2. $\frac{35}{80}$ 7. -58 (-42)
- 3. /-61/ 8. 38.37 + (-61.1)
- 4. /16.5/ 9. -5.8(2.3)

5. -8 + 13

10. $-78 \div (-4)$

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Operations with Rational Numbers

Anticipatory Set - Discussion Questions (Hook)

- What are rational numbers?
- Give an example.
- If it's not rational; what is it? Give an example.
- If you had \$7 but owed a friend \$7, how much do you have? How can these numbers be expressed as opposites?

Vocabulary:

- <u>Rational Numbers</u>; are the set of numbers that can be expressed as a fraction a/b where *a* and *b* are integers and $b \neq 0$.
- <u>Irrational Numbers</u>; the numbers that cannot be expressed as terminating or repeating decimals.
- Integers the set of whole numbers, both positive and negative plus 0.
- **Opposites:** numbers that are the same distance from zero on the number line but have opposite signs.
- <u>Additive Inverse</u>; a number and it's opposite whose sum is zero.
- <u>Absolute Value</u>: the distance of a number on the number line from zero. It is always positive.

SOLUTIONS

Study Guide Page;	
1. 3.9	6. 39
2. 35/80	716
3. 61	822.4
4. 16.5	913.34
5. 5	10. 19.5
Practice Page;	
1. 1.9	0 10. 93.4
2. 22	11. 6
3. 23/56	12. 67
422	13. 27
5123	144.55
6. 35/2 or 17 1/2	15. 21/20 or 1 1/20
70.48	16. 21.4
814.7	17. 3 17/25
9199/240	18, 105,3

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The Percent Proportion

Anticipatory Set - Discussion Questions (Hook)

- What is a percent?
- What is a ratio?
- List some examples of each.
- What are some ways we see and use percent in daily life?

Vocabulary:

- Percent; is a ratio that compares a number to 100.
- <u>Percent Proportion:</u> two ratios whose cross products are equal.
- <u>Ratio</u>; a way to show a relationship between two numbers of the same kind.
- **<u>Proportion</u>** is an equation that states that two or more ratios are equal.
- •

SOLUTIONS

5. 40%

6.70

7.160

8. 9.5

Study Guide Page;

- 1. 12
- 2. 60%
- 3. 90
- 4. 20%

Practice Page;

1.	4.5	10. 21
2.	62.5 %	11. 30
3.	70	12.68%
4.	48	13.54
5.	0.25%	14.50%
6.	1.25	15. 200
7.	24.5	16.288
8.	125%	17.78
9.	150	18.12

Exponents

Anticipatory Set - Discussion Questions (Hook)

- What is an exponent?
- Where do you see them?
- How do they work?
- What are some ways we see and use exponents in daily life?
- How can they help us in math?
- In what other subjects do you use exponents? ٠

Vocabulary:

- Exponent: (AKA the index or power) tells how many times to use that number in multiplication. It is written as a small number to the right and above the base.
- Base; the number that is being multiplied.
- **<u>Power:</u>** how many times the base is multiplied by itself.
- Expanded Form: written out the long way; such as $2 \times 2 \times 2 \times 2 \times 2 \times 2$.

	SOLUTIONS	\sum
Study Guide Page;		
1. 5 ⁶	5. 7 × 7 × 7 × 7	8. 18
2. 8 ³	6. 2×2×2×2×2×	9. 1000
3. 12 ⁷	2 x 2 x 2	10.144
4. 3 × 3 × 3 × 3 × 3	7.8	11. 15625
Practice Page		

Practice Page;

1.	6 ⁷	10. 24 × 24 × 24 × 24	19.7,529,536
2.	18 ⁴	11. 38 × 38	20256
3.	235 ⁴	12. 1,000,000	21. 815,730,721
4.	10 ⁷	13.9	22.36
5.	34 ⁷	14.1	23.1
6.	4 ⁸	15343	24.1/9
7.	9 × 9 × 9 × 9	16.125	25. 1/256
8.	7 × 7 × 7 × 7 × 7	17.90	
9.	12 × 12 × 12	18.91,125	

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- 1. Determine the perimeter and area of the desk you are working on.
- 2. What is the perimeter an area of this paper in inches?
- 3. Determine the perimeter and area of a rectangle that measures 3 units by 5 units.

4. Determine the perimeter and area of a rectangle that measures 1 unit by 10 units.

- 1. Determine the perimeter and area of the door to your classroom.
- 2. Determine the perimeter and area of a square whose sides measure 8 units.
- 3. Determine the perimeter and area of a rectangle that measures 3 cm by 2 cm.

- 4. Determine the perimeter and area of a rectangle that measures 7 yards by 1 yard.
- 5. Determine the perimeter and area of a square that measures 7 km on each side.
- 6. Determine the perimeter of a parallelogram with a height of 2 units, whose sides measure 8 units and 2.5 units.

Perimeter & Area

Anticipatory Set - Discussion Questions (Hook)

- How is perimeter different from area?
- What other subjects use area and/or perimeter?
- Give an example of some ways we see and use area and perimeter in daily life?
- What is the perimeter and area of your classroom?

Vocabulary:

- <u>Perimeter</u>; the distance around a geometric figure, measured in linear units.
- <u>Area;</u> the number of square units needed to cover a surface.

SOLUTIONS

Study Guide Page;

- 1. Solutions will vary; students may use inches or centimeters.
- 2. Based on copies of 8 $\frac{1}{2}$ x 11 inches; Perimeter = 39 inches; area = 93.5 in²
- 3. Perimeter is 16 units and area is 15 square units
- 4. Perimeter is 22 units and area is 10 square units

Practice Page;

- 1. Solutions will vary; students may use inches or centimeters.
- 2. The perimeter is 32 units and the area is 64 square units.
- 3. Perimeter is 10 cm and area is 6 square cm.
- 4. Perimeter is 16 yards and area is 7 square yards.
- 5. Perimeter is 28 km and area is 28 square km.
- 6. Perimeter is 21 units and area is 20 square units.

<u>Area & Circumference of Circles</u>

Area of a circle = πr^2 Circumference of a circle = πd

If you have the DIAMETER and need the RADIUS, divide by 2.

If you have the RADIUS and need the DIAMETER, multiply by 2.

 $\Pi = 3.14$

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 Determine the circumference of the circle to the nearest tenth if the radius is 3 feet.

- 2. Determine the circumference of the circle to the nearest tenth if the diameter is 24 centimeters.
- 3. Determine the area of the circle to the nearest tenth if the radius is 4 inches.

- 1. Determine the circumference of the circle to the nearest tenth if the radius is 12 cm.
- 2. Determine the area of the circle to the nearest tenth if the diameter is 20 cm.

- 3. The Earths circumference is about 25,000 miles. If you dug a tunnel to the center of the Earth, how long would it be?
- 4. A bicycle tire has a diameter of 27 inches, how far would the bicycle travel in 10 rotations of the tire?

- 5. The Newkirk City Council is planning to install an updated tornado warning system. The new signal will be audible for a 2-mile radius. What is the area of the region that will be able to hear the new signal?
- 6. The circular region inside a traffic circle is 250 feet across. The towns Beautification Club wish to plant flowers in this area. How much space will they be planting in?

Area & Circumference of Circles

Anticipatory Set - Discussion Questions (Hook)

- How are perimeter and circumference similar?
- What is a pi?
- Where have you used pi before?
- Roll up a sheet of paper; how do the paper's measurements relate to the circumference?

Vocabulary:

- <u>Circumference</u>; the distance around a circle
- <u>Diameter</u>: The distance from one edge of a circle to the other passing through the center.
- **<u>Radius</u>** The distance from the center of a circle to its edge.
- <u>Pi</u>: the ratio of the circumference of a circle to its diameter.

SOLUTIONS

Study Guide Page;

- 1. About 18.8 feet
- 2. About 75.4 centimeters
- 3. About 50.3 square inches

Practice Page;

- 1. 75.4 cm
- 2. About 314.2 cm
- 3. About 3,979 miles.
- 4. About 848.2 inches
- 5. About 13 square miles
- 6. About 49,087 squared feet

- 1. Determine the volume of a cube 3 inches on each side.
- 2. Determine the volume of a rectangular prism measuring 2 feet by 3 feet by 4 feet.
- 3. Determine the volume of a glass globe with a radius of 6 inches.
- 4. Determine the volume of a cylinder with a diameter of 16 feet and a height of 9 feet.

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- 2. A scoop of strawberry ice cream has a radius of 3 cm. What is the volume of the scoop of ice cream?
- 3. A cylindrical candy container has a radius of 3.1 inches and a height of 12 inches. Determine the volume.
- 4. Firewood is sold by a measure known, as a "cord" A full cord is a stack that measures $8 \times 4 \times 4$ feet.
 - a. What is the volume of a full cord of firewood?
 - b. What is the volume of a "half-cord" of firewood?
- 5. A cylindrical fish tank has a height of 38 inches and a diameter of 26 inches. What is the volume of the fish tank?
- 6. At the movie theatre a box of popcorn measures 11 inches x 4 inches x 8 inches. Determine its volume.

Volume

Anticipatory Set - Discussion Questions (Hook)

- What is a solid figure?
- How can we measure how much it takes to fill that object?
- If we filled a cub with sand, how could we measure how much sand is needed?
- How does knowing the volume of objects help us in daily life? (Consider food items, liquids, filling a pool or planter)

Vocabulary:

- <u>Volume</u>; the measure of space occupied by a solid.
- <u>Solid</u>: A three-dimensional object with length, depth, and height.

SOLUTIONS

Study Guide Page;

- 1. 27 cubic inches
- 2. 24 cubic feet
- 3. 508.68 cubic inches
- 4. 1809 6 cubic feet

Practice Page;

- 1. 220 cubic feet
- 2. 113.04 cubic cm
- 3. 396.3 cubic inches
- 4. 128 cubic feet and 64 cubic feet
- 5. 20,165.08 cubic inches
- 6. 353 cubic inches

For questions 1 - 4 use the spinner provided. Write solutions in probability format.

- What is the probability of landing on "Bankrupt"?
- 2. What is the probability of landing on "50"?
- 3. What is the probability of landing on a value up to 150?

4. What is the probability of landing on a non-numerical spot?

Solve the following probability questions. Write solutions in probability format.

5. The letters of the word CHANCE are printed on individual cards and drawn at random. What is the probability of;

What You Kno

- a. Choosing the letter "C"?
- b. Choosing a vowel?
- c. Choosing the letter "H"?
- 6. A bowl contains 5 red, 7 blue, 6 yellow and 10 green chips.
 - a. What is the probability of NOT choosing green?
 - b. What is the probability of choosing red or yellow?
 - c. What is the probability of choosing blue?

Probability & Odds

Anticipatory Set - Discussion Questions (Hook)

- What is the difference between probability and odds?
- What is the difference between theoretical and experimental probability?
- List some examples of each.
- What are some ways we see and use probability in daily life such as weather forecasting?

Vocabulary:

- <u>Probability</u>: the probability of an event is the ratio of the number of favorable outcomes to the number of possible outcomes.
- <u>Odds</u>; the odds of an event occurring is the ratio that compares the number of ways an event can occur to the number of ways it cannot occur.
- Experimental probability: the probability that occurs when an event happens.
- <u>Theoretical probability:</u> the expected mathematical probability.
- <u>Sample space</u>: The list of all possible outcomes.
- <u>Equally likely</u>: when there are n outcomes and the probability of each outcome is 1/n.

SOLUTIONS

Study Guide Page;

- 1. P(6) = 1/8
- 2. P(yellow) = $\frac{1}{4}$
- 3. P(purple or 5) = 3/8

Practice Page;

- 1. P(bankrupt) = 1/12
- 2. P(50) = 1/6
- 3. P(value up to 150) = $\frac{1}{2}$
- 4. P(non-numerical) = 1/6
- 5. P(C) = 1/3; P(vowel) = 1/3; P(H) = 1/6
- 6. P(not green) = 9/14, P(red or yellow) = 11/28, P(blue) = 7/28

Mean =	_ Median =	Mode =	
2. {3, 5, 8, 1, 4, 11, 3	3}		

Mean = Median = Mode =

Determine the mean. median and mode of each set of data.

1. {52, 53, 53, 53, 55, 55, 57}

- 2. {201, 201, 200, 199, 199}
- 3. {3, 11, 26, 4, 1}
- 4. Karl is running a lemonade stand. On Tuesday he made \$3.50, on Wednesday he made \$\$4.00, on Thursday \$5.00 and on Friday \$4.50. What was his mean average of his daily profit?
- 5. On her first five history tests Ingrid received the following scores: 82, 96, 92, 83 and 91. What must she earn in the sixth test for her mean average to be a 90%?
- 6. Nina's average score for bowling nine games is 108. What is the lowest score she can receive for the tenth game to have a mean average of 110?

Measures of Central Tendency

Anticipatory Set - Discussion Questions (Hook)

- What is an "average"?
- Which measure do you think is most representative of the "average"?
- What are some ways we see and use averages in daily life?

Vocabulary:

- <u>Measures of central tendency</u>; numbers used to represent data
- <u>Mean</u>; the sum of the numbers in a set of data divided by the number of items in the set.
- <u>Median</u>; the middle number in a set of data that is arranged in numerical order. If there is an even number of data items then the median in the mean of the two middle numbers.
- Mode: the number(s) that appear most often in a set of data

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SOLUTIONS

Study Guide Page;

- 1. 5, 5, 5
- 2. 5, 4, 3

Practice Page ;

- 1. 54, 53, 53
- 2. 200, 200, 201 and 199
- 3. 9, 4, no mode
- 4. \$4.25
- 5. 96%
- 6. 128

Round to the nearest tenth if needed.

1. Find the length of the hypotenuse of a right triangle if the legs measure a = 15 and b = 8 $\,$

2. Find the length of the missing side if c = 25 and b = 10.

Determine the length of the missing side. Round to the nearest tenth if needed.

- 1. Determine the length of c id a = 7 and b = 13.
- 2. Determine the length of c is a = 10 and b = 6.
- 3. Determine the length of b if a = 6 and c = 14.
- 4. Determine the length of a if b = 11 and c = 21.
- 5. A square park has a diagonal walkway from one corner to the other. If the walkway is 70 meter long what is the approximate length of each side of the park?
- 6. Do the measures 4 inches, 6 inches and 9 inches from a right triangle? Justify your anser.

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The Pythagorean Theorem

Anticipatory Set - Discussion Questions (Hook)

- What do you know about the Pythagorean Theorem?
- Name the part of a right triangle?
- How can this help us find distances?

Vocabulary:

- <u>Hypotenuse</u>; the longest side of a triangle, always across from the right angle
- Legs: the two sides that form the right angle

SOLUTIONS

Study Guide Page;

- 1. 17 units
- 2. a ≈ 22.9

Practice Page:

- 1. c ≈ 14.8
- 2. c ≈ 11.7
- 3. b = 12.7
- 4. a = 17.9
- 5. 35 meters
- 6. No, because $4^2 + 6^2 \neq 9^2$

Plot the following points on the coordinate grid.

- 1. (-5,5)
- 2. (1,4)
- 3. (5,0)
- 4. (-4,-3)
- 5. (1,-6)

List the coordinates for the following points on the coordinate grid.

The Coordinate Plane

Anticipatory Set - Discussion Questions (Hook)

- What is the coordinate plane?
- How have you used it in the past?
- How does it relate to using map coordinates?
- Can it help us to find distances?

Vocabulary:

- <u>x-coordinate</u> from Latin
- <u>y-coordinate</u>; The
- Origin: The
- Coordinate pairs:

SOLUTIONS

Study Guide Page;

Practice Page Solutions

1. (-5,2)

2. (6,6) 3. (3,-2) 4. (-4,-5)

5. (5,2) 6. (-2,-3)

Name		
<u> </u>	IDDLE SCHOOL MAT	TH REVIEW
%	QUIZ #1	
$1.\frac{2}{9}+\frac{1}{3}$	$2.\frac{7}{10}-\frac{2}{15}$	$3.\frac{2}{7} * \frac{14}{13}$
, 3, 1	$(4 * 3)^2$	<i>,</i> , 23 ,
$4 \div - 5$	5. $\frac{1}{9+3}$	6. /- 56 /
		(\times)
738.9 + 24	1.2	

8. -3/4 ÷ 12

- 9. Cecelia usually makes 85% of her shots in Basketball. If she shoots 20 shots, how many will she like make?
- 10. Paul answered 36 items correctly on a 40-item quiz. What percent did he answer correctly?
- 11. Evaluate 5⁴
- 12. A square garden has a length of 5.8 meters. Determine the perimeter and area of the garden. Round to the nearest tenth.

MIDDLE SCHOOL MATH REVIEW QUIZ #1 SOLUTIONS

- 1. 5/9
- 2. 17/30
- 3. 4/3 or 11/3
- 4. 15/7 or 2 1/7
- 5. 12
- 6. 23/56
- 7. -14.7
- 8. -1/16
- 9. 17
- 10.90%
- 11. 625
- 12. Perimeter = 23.2 m and area = 33.6 squared meters

MIDDLE SCHOOL MATH REVIEW QUIZ #2 SOLUTIONS

1. 4749.25 cubic inches

- 2. 75.4 cm
- 3. P(black) = 3/10
- 4. 32 1/3 (or 32.33), 23, 23
- 5. Yes, because $10^2 + 24^2 = 26^2$
- 6. 11.5 inches
- 7. P(\$5) = 1/3
- 8. P(not \$1) = 1/2
- 9. See graph
- 10.(6,-2)

MIDDLE SCHOOL MATH REVIEW QUIZ #2

- 2. What is the circumference of a circle with a radius of 12 cm?
- 3. What is the probability of choosing a black marble from the bag? Write in probability format.

4. Determine the mean, median and mode for the following set of data points; {3, 7, 21, 23, 63, 27, 29, 95, 23}

5. Do the side measurements of 10m, 24m and 26m form a right triangle? Justify your answer.

6. If the diameter of a tire is 23 inches what is its radius?

7. Using the spinner, determine the probability on landing on \$5.

8. Using the spinner determine the probability of NOT landing on \$1.

\$5

\$10

\$

9. Plot the point (3,5)

10. Give coordinates for point x.

\$1

\$10

\$5

\$1

\$5

Name _____

MIDDLE SCHOOL MATH REVIEW FINAL TEST

1. Solve the following equation; $9^2 + 3 \times (9 - 5)^2 / 4 = x$

How would the solution change if it were written as;

 $\frac{9^2 + 3 \times (9 - 5)^2}{4} = x$

2. /-116.75/

3. Chloe and Derrick are evaluating $3[4 + (27 \div 3)]^2$. Who is correct and explain why.

ChloeDerrick
$$3[4 + (27 \div 3)]^2 = 3(4 + 9^2)$$
 $3[4 + (27 \div 3)]^2 = 3(4 + 9)^2$ $= 3 (4 + 81)$ $= 3 (13)^2$ $= 3(85)$ $= 3(169)$ $= 255$ $= 507$

- 4. A glucose solution is prepared by dissolving 6 milliliters of glucose in 120 milliliters of solution. What is the percent of glucose in the solution?
- 5. The Parks & Recreation Department uses an empty city lot for a community garden. Each participant is allotted a space measuring 18 feet by 90 feet. What is the perimeter and area of each plot?

- 6. Absolute value is the distance from _____
- 7. 1.34 (-0.458)
- 8. A rectangular prism has a volume of 12 cubic feet. What are the possible dimensions of the prism?
- 9. Determine the following probabilities. Write in probability format.
 - a. What is the probability of choosing a striped marble?
 - b. What is the probability of choosing a black OR a white marble?
 - c. What is the probability of choosing a white marble?

10. -32.25 ÷ (-2.5)

11. Evaluate 6³

12. A right triangle has lags that measure a = 5m and b = 20 meters. Determine the length of the hypotenuse. Round to the nearest tenth if needed.

- 13. A right triangle has lengths a = 16 cm and c= 34 cm. Determine the length of side b. Round to the nearest tenth if needed.
- 14. Aaron's scores on his first four science tests are 86, 90, 84, and 91. What test score must he earn on the fifth test so that his mean average for the class will be exactly 88%?
- 15. Plot the point (-4,2) on the graph and label it "x"
- 16. Plot the point (4,-3) on the graph and label it "y".

Name ____

MIDDLE SCHOOL MATH REVIEW FINAL TEST - SOLUTIONS

1. Solve the following equation; $9^2 + 3 \times (9 - 5)^2 / 4 = x$

How would the solution change if it were written as; $9^2 + 3 \times (9 - 5)^2$

= x

In the first equation you must divide before you add. In the second you must add first before dividing.

- 2. 116.75
- 3. Chloe and Derrick are evaluating $3[4 + (27 \div 3)]^2$. Who is correct and explain why. Derrick; Chloe squared the incorrect quantity.

4. 5%

- 5. Perimeter is 216 feet and the area is 1620 squared feet.
- 6. Absolute value is the distance from ZERO
- 7. 1.798
- 8. 1 × 1 × 12; 2 × 2 × 3; 1 × 3 × 4
- 9. P(stripped) = 2/5, P(black or white) = 3/5, P(white) = 3/10
- 10.12.9
- 11. 216
- 12. c = 20.6 m
- 13.b = 30 cm
- 14.89%
- 15. See graph
- 16. See graph

Inverse Linear Linear Multiplication Multiplication Numbers Parallel Percent Percent Perimeter Quadrant Ratio Rectangle Subtraction Square Triangle Variable Zero
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Math Review Terms Word Search Puzzle

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Middle School Math Reference Card

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Order of Operations

Clear ALL grouping symbols Evaluate exponents, radicals, & square roots Perform multiplication AND/OR division from left to right Perform addition AND/OR subtraction from left to right

<u>Formulas</u>

Perimeter: sum of all the side lengths of a shape Circumference of a circle: πd or $2\pi r$ Area of a square: s² Area Area of a rectangle: l x w is measured in Area od a trapezoid: $\frac{1}{2}$ h(b₁ + b₂) units squared Area of a triangle: ½ bh Area of a circle: πr^2 Volume of a cube: s³ Volume of a rectangular prism: lwh Volume of a cylinder: π r²h Volume Volume of a sphere: $4/3 \pi r^3$ is measured in Volume of a cone: $1/3\pi r^2 h$ units cubed Volume of a pyramid: 1/3Bh Surface area of a rectangular prism: $2(hl \times hw \times lw)$ Pythagorean Theorem: $a^2 + b^2 = c^2$ Distance = rate x time Simple Interest = $principle \times rate \times time$ Slope intercept form: y = mx + bSlope formula: <u>y1 – y</u>2 $x_1 - x_2$ Distance Formula: $\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$ Quadratic formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ Greatest distance in a rectangular prism: $\sqrt{l^2 + w^2 + h^2}$ Permutations / Combinations Permutations = n^r (repetition allowed, order matters) Permutations = no repetitions, order matters; $\frac{n!}{(n-r)!}$ Combinations = $\frac{n!}{r!(n-r)!}$ (where n = number of items and r = how many we choose)Percent Proportion: Part % Whole 100 Ratios: a∕b; a to b; a:b Arithmetic Sequence: $a_n = a_1 + (n-1)d$ Geometric Sequence: $a_n = a_1 r^{n-1}$ Creative Learnina Solutions 2019

Equivalent Weights & Measures 60 seconds in 1 minute 60 minutes in 1 hour 24 hours in 1 day 365 days in one year, leap year adds 1 day 1 inch = 2.54 centimeters 1 meter = 39.37 inches1 mile = 5,280 feet; 1, 760 yards; 1,609 kilometers 1 kilometer = 0.62 mile 1 pound = 16 ounces; 0.454 kilograms 1 kilogram = 2.2 pounds1 ton = 2,000 pounds1 cup = 8 fluid ounces 1 pint = 2 cups1 quart = 2 pints ; 4 cups; 32 ounces 1 gallon = 4 guarts; 1.785 liters 1 liter = 0.264 gallons; 1,000 cubic centimeters Geometry (x,y) ordered pair coordinates Complementary angles = 90 degrees Supplementary angles = 180 degrees Right angles = 90 degrees Acute angles < 90 degrees Obtuse angles > 90 degrees Mathematical Symbols

/ / absolute value	≈ approximately
> greater than	≠ not equal to
< less than	√ square root
\geq greater than or equal to $\sqrt[3]{}$ cube	root
≤ less than or equal to	π (ρί) 3.14
± ρlus or minus	$f(\mathbf{x})$ function , f of \mathbf{x}

parallel to	: therefore
ot perpendicular to	! factorial
≅ congruent to	~ similar to
– x the opposite of x	$x^{n} \times to the n^{th}$ power
	20 1 1 1 1 1 1

<u>Probability</u>

Probability of an event = <u>desired outcome</u> all possible outcomes

P(a) = probability of event aComplementary events: P(a) + P(not a) = 1Exponent Rules

$$a^n \bullet a^m = a^{n+m}$$

$$a^n \bullet b^n = (a \bullet b)^n \qquad (b^n)^m = k$$

$$\frac{a^{n}}{a^{m}} = a^{n-m} \qquad \qquad b^{-n} = \frac{1}{b^{n}}$$
$$b^{0} = b$$
$$b^{0} = b$$

Division by zero is UNDEFINED! Don't do it!