Monroe Township School District
Monroe Township, New Jersey

2025 Middle School 6th Grade Accelerated Math
PREPARATION PACKET

Welcome to **6th Grade Accelerated Mathematics**! This course will provide you with the fundamental tools of mathematical understanding that will support you in your high school courses and beyond! Since you will be covering ***7th and 8th grade math concepts*** *this year,* this packet contains review material of the 6th grade concepts, skills, and procedures that should be mastered **BEFORE** entering 6th grade accelerated math in the fall. Essentially, this packet provides a review of the major 6th grade topics as well as a preview of 7th grade topics. The sections are based on the NJ 2016 Student Learning Standards.

In addition, you will find some exercises from the Grade 8 Summer Packet towards the end. These problems are completely optional, so do not worry if you cannot solve them. Feel free to try them and complete any that you may know how to do!

Here are some websites you might find particularly useful:

- http://www.khanacademy.org/
- http://www.ixl.com/math/ (free version)
- Study Island (use Clever)
- enVisions (use Clever)

This collection of problems will identify those concepts that you have mastered as well as those you will need to practice and review. You are expected to seek extra help immediately on those concepts with which you have not demonstrated proficiency. Be resourceful – use the online resources!

*****SOLVE THESE PROBLEMS WITHOUT THE USE OF A CALCULATOR AND SHOW ALL WORK*****

You will be responsible for handing in the completed packet with all work shown ON THE FIRST DAY OF SCHOOL. The problems here are very representative of the types of items you will need to have mastered BEFORE 6th Grade Accelerated Math… so we strongly encourage you to include this packet in your summer festivities! Good luck and enjoy! ☺

** If printing -- Pages #2-12 are mandatory, #13-19 are optional. **

Part I: Mandatory

RATIOS AND PROPORTIONAL REASONING

1. You drive a distance of 242 miles and use 11 gallons of gas. What is the average miles per gallon of your car?

ANSWER: _____

2. You get paid $20 for 4 hours of work. What is your hourly rate?

ANSWER: _____

3. A volleyball team won 10 of its 16 games. What is the win-loss ratio?

ANSWER: _____

4. The adult - child ratio at a local daycare center is 3 to 16. At the same rate, how many adults are needed for 48 children?

ANSWER: _____

5. 17 out of 20 adults own a cell phone. Represent this ratio as a percent.

ANSWER: _____

6. At a light bulb factory, 3 out of every 1,000 bulbs produced are defective. If 5,000 bulbs are produced, how many would you expect to be defective?

ANSWER: _____

TOTAL SCORE: _____ of 6

7. Decide whether the pair of ratios form a proportion: $\frac{15}{12} \stackrel{?}{=} \frac{4.5}{3.6}$

ANSWER: _____

8. Solve the proportion $\frac{y}{10} = \frac{3}{5}$

ANSWER: _____

9. Which is a better buy, 14oz for 98¢ or 8oz for 64¢?

ANSWER: _____

10. Complete the ratio table below and then write the three new equivalent ratios.

72	**36**	**24**	**12**
126			

ANSWER: _____

11. A fruit bowl contains 3 apples, 2 bananas, and 5 pears. What is the ratio of pears to apples?

ANSWER: _____

TOTAL SCORE: _____ of 5

THE NUMBER SYSTEM

12. 4 students equally share $\frac{3}{4}$ of a pizza. How much pizza does each student get?

ANSWER: _____

13. What is the area of a rectangular parcel of land that is $\frac{7}{8}$ mile by $1\frac{1}{2}$ miles?

ANSWER: _____

14. There was 2/3 of a pan of lasagna in the refrigerator. Bill and his friends ate half of what was left. Write a number sentence and draw a model to represent the problem. How much of the pan did they eat?

ANSWER: _____

15. Ms. Balestrieri is bagging snacks for a class trip. She has 72 pretzel rods and 48 pieces of goldfish. What is the largest number of snack bags she can make so that the bags are all the same and there is nothing left over?

ANSWER: _____

16. The beacon on the cell phone tower blinks every 5 seconds and the beacon on the water tower blinks every 8 seconds. The lights blink together. How many seconds will pass before the two lights blink together again?

ANSWER: _____

TOTAL SCORE: _____ of 5

Find the sum, difference, product or quotient. Show all work.

17. 37.65 - 4.238

ANSWER: _____

18. 297.57 ÷ 6.5

ANSWER: _____

19. 74,404 ÷ 356

ANSWER: _____

20. 417 + 37.95

ANSWER: _____

21. 12.08 × 35.2

ANSWER: _____

22. Complete the table.

Fraction	Decimal	Percent
$\frac{4}{5}$		
	0.55	
		35%

TOTAL SCORE: _____ of 6

Find the sum, difference, product or quotient. Show all work.

23. $2\frac{1}{2} - \frac{7}{8} =$

ANSWER: _____

24. $4\frac{3}{6} \times \frac{1}{9} =$

ANSWER: _____

25. $5 \div \frac{3}{10} =$

ANSWER: _____

26. $\frac{5}{6} \div 12 =$

ANSWER: _____

27. What is $\frac{2}{3}$ *of* 120 ?

ANSWER: _____

TOTAL SCORE: _____ of 5

EXPRESSIONS AND EQUATIONS

28. Simplify $3^3 \div 9 + 15 \times 4$

ANSWER: _____

29. Evaluate for $x = 7$ $\quad 4x + 17$

ANSWER: _____

30. Solve $\quad x - 10 = 23$

ANSWER: _____

31. Simplify $48 - 2 \times 4^2 \div 8 + 13$

ANSWER: _____

32. Write an algebraic expression for "a number p increased by 7"

ANSWER: _____

33. Write an expression equal to $x + x + x + x$

ANSWER: _____

34. Use the distributive property to write an equivalent expression for $4(x - 2)$.

ANSWER: _____

TOTAL SCORE: _____ of 7

35. Solve the equation. $3x = 15$

ANSWER: _____

36. Jack has $25 to spend at the mall. Write an inequality that expresses symbolically the amount of money, m, that Jack can spend.

ANSWER: _____

37. State a value for m that would satisfy the inequality from #36. Then, state a value that would NOT satisfy the inequality.

ANSWER: _____

38. Cinderella's carriage travels at 4 miles per hour. Write and solve an equation to find out how many hours a 48-mile trip will take at that rate.

ANSWER: _____

39. Write and solve an equation to find the width of a rectangle with a length of 18cm and an area of 72 square centimeters.

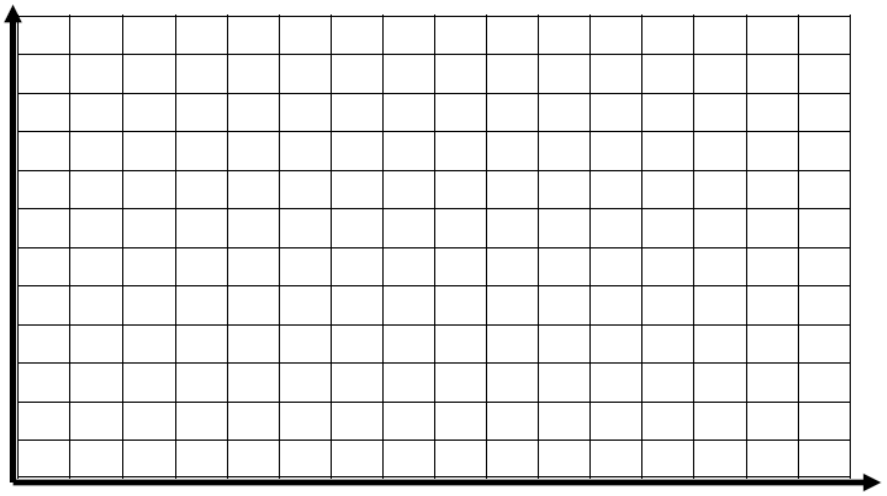
ANSWER: _____

TOTAL SCORE: _____ of 5

40. Laura has pledges of $5 for each mile she walks in the Juvenile Diabetes Walkathon fundraiser.

- Use the table below to record the miles walked and the money earned for miles 0 through 6.
- Graph the data on the grid. Remember to select a scale and label the graph.
- Write a rule relating miles walked to money collected.

Miles	$

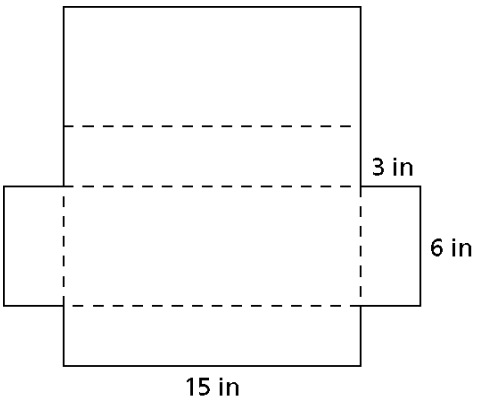


41. The perimeter of an equilateral triangle is 96 centimeters. The length of one side is 4x centimeters. Write and solve an equation to find x. Then, use the x value to find the length of each side.

TOTAL SCORE: _____ of 2

GEOMETRY

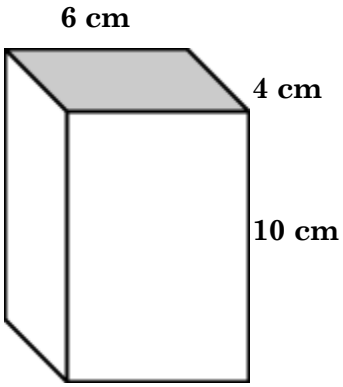
42. This net can be folded on the dashed lines to make a box. What is the surface area of the box?



ANSWER: _____

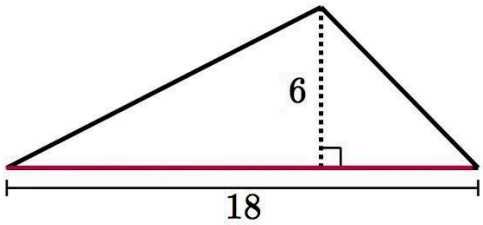
43. State the name of the 3D shape below: _____

What is the volume of the figure?



ANSWER: _____

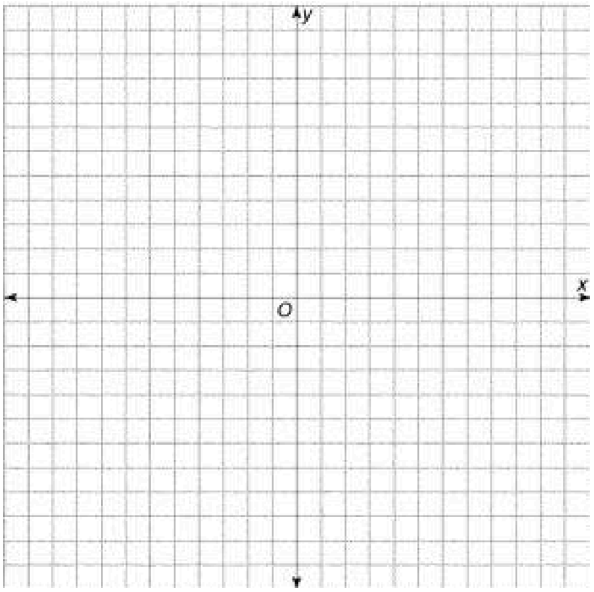
44. Find the area of the triangle below.



ANSWER: _____

45. Plot the following points on the grid below. (-5,6) (-5, -3) and (2,6).

- Add a fourth point to create a rectangle.
- Give the coordinates of the new point.
- Find the area and perimeter of the rectangle.



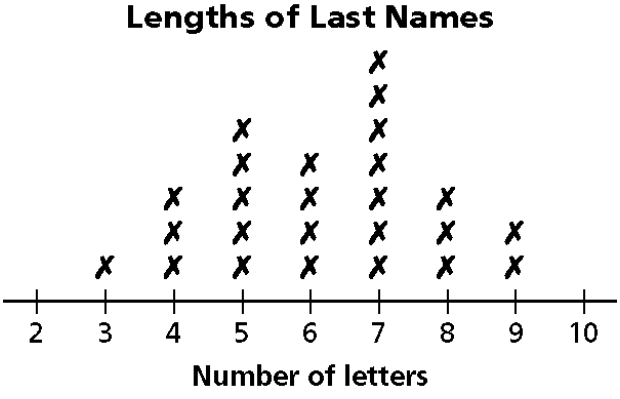
AREA: _____

PERIMETER: _____

TOTAL SCORE: _____ of 4

STATISTICS AND PROBABILITY

46. For the distribution pictured below, tell how many people are represented by the data, and identify the mode, median, and range.



# of people: _____

Mode: _____

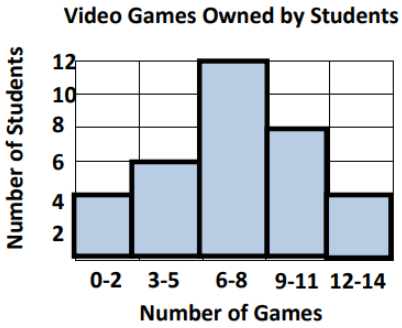
Median: _____

Range: _____

47. Mike was in charge of collecting contributions for the Food Bank. He received contributions of $13, $34, $26, $31 and $28 from five co-workers. Find the median value of these contributions.

ANSWER: _____

48. Use the histogram below to answer the following questions:



a) How many students own 12-14 video games?

b) **Most** students own approximately how many video games?

49. Thirteen bowlers were asked what their score was on their last game. The scores are shown below.

190, 154, 150, 194, 182, 170, 190, 151, 190, 170, 178, 161, 180

Find the range of the bowlers' scores.

ANSWER: _____

50. The following data shows the high temperatures for a week in May in Michigan. Write the 5-number summary (minimum, first quartile, median (aka 2nd quartile), third quartile, and maximum) and then represent the data with a **boxplot**.

Min = _____ Q1 = _____ Q2: _____ Q3: _____ Max: _____

Day	Temp
Sun	66° F
Mon	67° F
Tue	71° F
Wed	68° F
Thurs	62° F
Fri	59° F
Sat	62° F

TOTAL SCORE: _____ of 5

Part II: Optional

This portion is optional as they are problems from the entering grade 8 packet. These are concepts that you will learn about this year!

Try any you think you might be able to do, but do not worry if you cannot do the problems. Only attempt problems you are comfortable with.

Ratios and Proportional Relationships

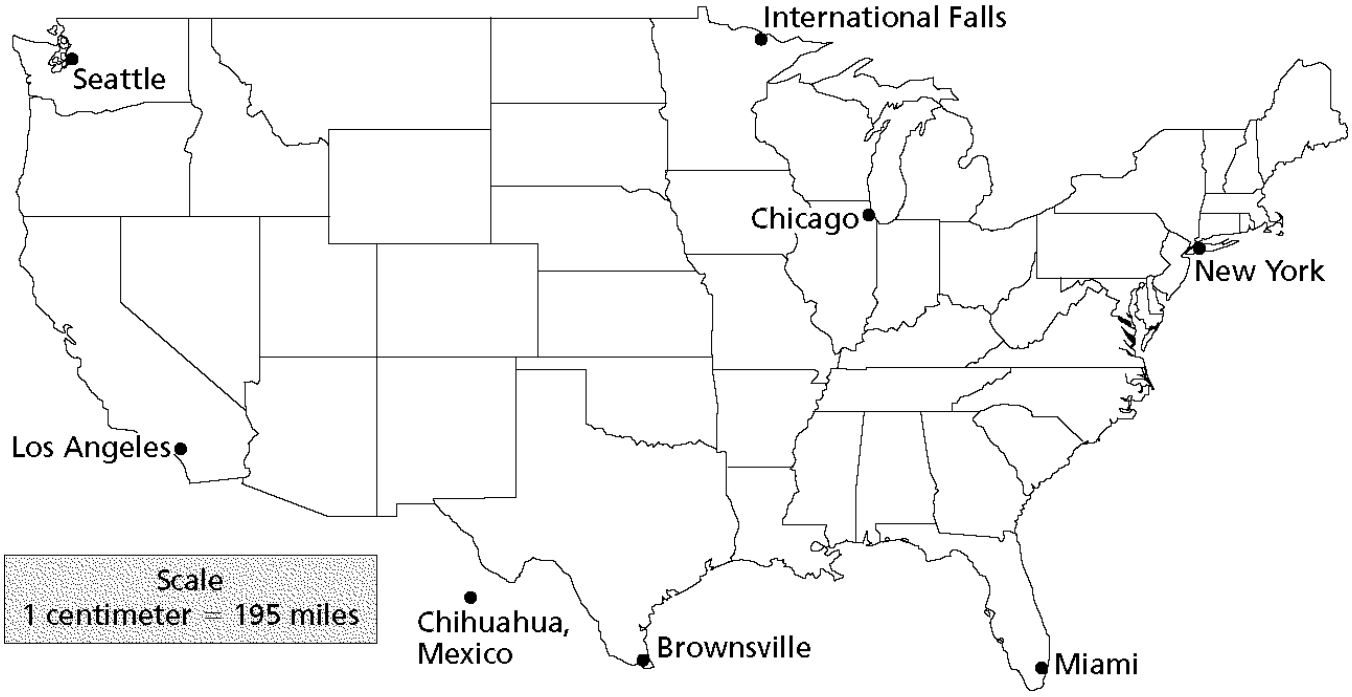
Use the table below for #1.

The table shows the numbers of hours Melissa works and the amounts that she earns.

Melissa's Earnings					
Hours Worked	2	4	7	8	10
Earnings (in $)	44	88	154	176	220

1. Is the relationship between time and earnings proportional? Explain why or why not using a proportion to support your reasoning.

For #2, please use the map below.



2. What would be the approximate driving time to travel from Seattle to New York at an average speed of 55 miles per hour? Use a proportion to calculate your answer.

3. If David walks ½ mile in ¼ hour, then how fast does David walk in one hour? (In other words, what is David's "**unit rate**"?) Create a rate table to show distance walked per ¼ hour.

4. An important category of percentage problems is markup & markdown problems. Solve the following:

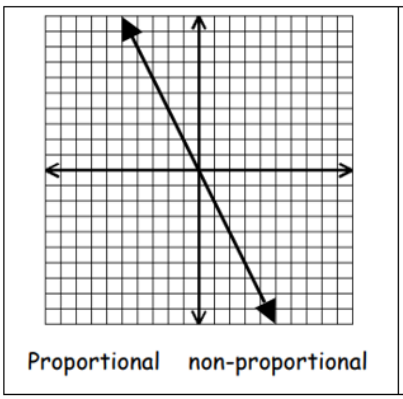
   a. A sporting goods store pays its wholesaler $50 for a certain baseball glove and then sells the glove to customers at a retail value of $90. What is the **markup rate**?

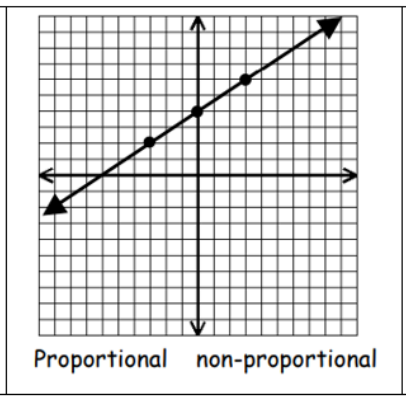
   b. A sweater originally priced at $44 is marked down 25%. What is the **sale price**?

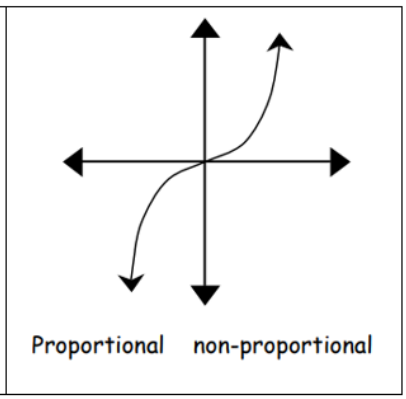
5. The table shows the rate at which water is being pumped into a swimming pool. Does the table represent a proportional relationship? If so, what is the equation?

Time (min)	2	5	7	12
Amount (gal)	36	90	126	216

6. Determine which of the following graphs represent proportional relationships. Circle the appropriate response.







The Number System

7. Fill in the missing fraction/decimal/percent conversions below.

FRACTION	DECIMAL	PERCENT
	0.12	
$\frac{7}{8}$		
		125%

8. Use the **distributive property** to write an equivalent variable expression.

$-7(2x-5)$

9. Find the sum or difference.

a. $\frac{5}{16}+\frac{3}{4}$

b. $5\frac{3}{32}-1\frac{5}{8}$

10. Find the quotient or product.

a. $1\frac{4}{5}\bullet 20$

b. $\frac{1}{2}\div\frac{3}{4}$

11. Simplify and show all steps of work: $10 - (50 \div (-2 \bullet 25) + 7) \bullet 2^2$

Expressions & Equations

12. Simplify the following expressions:

a. $m + 0.5m$ b. $(6p + 4) + (-5p + 8)$ c. $6(x - 3) - 2(x - 5)$

13. The perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

14. Felicia is planning a white-water rafting trip. She compares two companies to find the better buy.

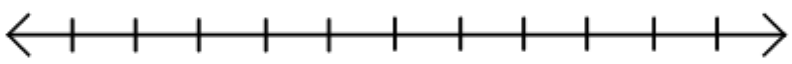
a. Sinking Rivers charges two hundred dollars for insurance and fifteen dollars an hour to rent the raft. Write an equation to represent Sinking Rivers' total cost (c) for any number of hours (h).

b. Floating Down the Stream charges thirty dollars an hour and one hundred and ten dollars for insurance. Write an equation to represent Floating Down the Stream's total cost (c) for any number of hours (h).

15. Solve: $2x + 17 = 81$

16. Solve and graph the inequality below:

$5x + 460 \geq 1,000$



Geometry

17. **<u>Illustrate</u>** each of the following terms by providing clear examples including angle measures.

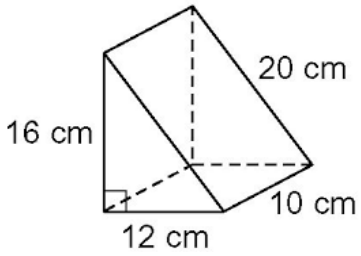
    a. Supplementary angles

    b. Complementary angles

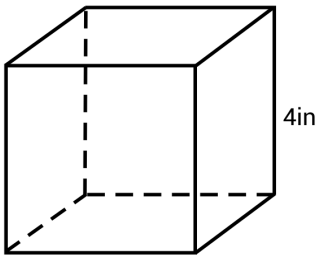
    c. Vertical angles

    d. Adjacent angles

18. What is the **VOLUME** of the triangular prism?



What is the total **SURFACE AREA** of the figure below?



Statistics and Probability

Match the following terms to their corresponding definition:

19. _____Probability

20. _____Law of Large Numbe

21. _____Random sample

22. _____Mean

23. _____Median

24. _____Mode

A. The middle number of an ordered set of numbers. If there is an even number in the set, then it is the average of the two middle values.

B. The "average" of a set of numbers – the sum of the set divided by the number in the set.

C. A number between 0 and 1 that describes the likelihood that an outcome will occur. It can be theoretical where it's the ratio of the number of favorable outcomes (assuming they are equally likely) to the total number of outcomes or experimental where it's the ratio of the number of favorable outcomes of a trial to the total number of trials in an experiment.

D. The most frequently occurring value in a numerical set.

E. As more trials of an experiment are conducted, the experimental probability more closely approximates the theoretical probability. If is not at all unusual to have 100% heads after three tosses of a fair coin, but it would be extremely unusual to have 100% heads after 1,000 tosses.

F. When you choose in such a way that gives every sample from a population an equally likely chance of being selected.

25. Each letter of the word "MATHEMATICS" is written on a separate slip of paper and placed in a hat. A letter is chosen at random from the hat.

    a. What is the probability of choosing "M" on your first try?

    b. Suppose you choose an "M" on your first try. You keep the slip of paper (do not replace it in the hat) and go for another letter. What is the probability of getting another "M"?