Get Ready for 9th Grade!
Summer Mathematics Activities

Dear Parents, Guardians, and Students,

Summer is a time to relax, explore, and have fun while keeping learning skills strong. Research shows that students can lose up to a month of math learning over the summer. Regular math practice helps students maintain their knowledge and confidence and prepare for the next grade. To help prevent this "summer slide," we have provided a variety of fun and engaging math activities for students to enjoy throughout the summer.

Daily Math Practice

We encourage students to complete one First in Math assignment each day to strengthen their math skills and build fluency.

Using the Summer Math Activity List

- Complete the activities in the boxes and cross off each activity as it is completed.
- Have fun completing a choice activity.
- Record completed activities on the activity log.
- Bring your completed log to school and show it to your new teacher to receive a special gift!

Helpful Materials

Keep these items nearby as you complete your summer math activities:

- Math notebook/journal from the school year
- A folder for organizing activities
- Blank paper
- Pencils
- A deck of playing cards
- Board games
- Coins

Our IB Transdisciplinary Theme, *How We Express Ourselves*, encourages scholars to explore, communicate, and apply ideas. Mathematics offers opportunities for creativity, problem-solving, and critical thinking. Whether cooking, shopping, traveling, or playing games, children can think mathematically in everyday situations.
Most importantly, encourage your child to explain their thinking as they solve problems. Asking questions such as, "How did you figure it out?" helps deepen understanding, build confidence, and strengthen mathematical reasoning.

We wish you a safe, enjoyable, and mathematically engaging summer!
Sincerely,

The Hempstead Public Schools Mathematics Team

Summer Math Activity Log

Activity log for student entering grade_____. Record the dates and descriptions of the math activities you complete. Bring this log back to your new teacher in September.

Activity #	Date Completed	Description of Activity
Example	**7/2/24**	**The Math Problem about drawing 2 dogs. *OR* choice activity, like Candy Land…**
#1		
#2		
#3		
#4		
#5		
#6		
#7		
#8		
#9		
#10		
#11		
#12		
#13		
#14		
#15		
#16		
#17		
#18		
#19		
#20		

Student's Name: _____

Parent Signature: _____

Summer Math Activity Log

Activity log for student entering grade_____. Record the dates and descriptions of the math activities you complete. Bring this log back to your new teacher in September.

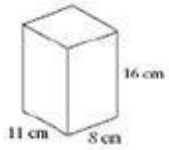
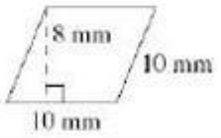
Activity #	Date Completed	Description of Activity
#21		
#22		
#23		
#24		
#25		
#26		
#27		
#28		
#29		
#30		
#31		
#32		
#33		
#34		
#35		
#36		
#37		
#38		
#39		
#40		

Student's Name: _____

Parent Signature: _____

Get Ready for Grade 9: Math Activities

Complete these math activities this summer. Each time, choose an activity from the boxes below – or from the back. Cross off a box when you do it and record the activity on your math log.

Choose from the Problem Set!! 	Find the volume: 	**Make a list of all the prime numbers between 50 and 75.**	**LCM (5, 10) =** **LCM (8, 12) =**	$1\frac{3}{5} - 9 =$
$\lvert -5 \rvert =$ $-\lvert -5 \rvert =$ $-\lvert 5 \rvert =$	Choose from the Problem Set!! 	What is the value of n? $\frac{3}{5} < \frac{n}{7} < \frac{4}{5}$	$2\frac{4}{5} \div 3\frac{1}{3} =$	**If John walks $\frac{1}{4}$ mile every $\frac{1}{2}$ hour, how far will he walk in three hours?**
Find the area: 	How many hours would it take you to count to one million? How many days would it take you to count to one million?	Choose from the Problem Set!! 	**Complete the pattern:** **{3, 7, 11, 15, , , }**	**Do the following points represent a point on the graph of y=x-4?** **(0, -4) (5,-1)**
Sammy has fifty coins in his pocket that add up to one dollar. How many coins of each denomination are in Sammy's pocket?	**Find the area of a circle if the diameter is 20 feet.**	Calculate: $(-3\frac{5}{6}) - 4\frac{1}{2} =$	**If 1,000 gumballs cost $20, how much would ten gumballs cost?**	Choose from the Problem Set!! 
Solve: **3w + 8 = 20**	**In which quadrant(s) could the following points be found?** **A B C** **(5, 3) (5, -3) (-5,3)**	Choose from the Problem Set!! 	**Dan's weekly salary is $70 less than Jerry's, whose weekly salary is $50 more than Sally's. If Sally earns $280 per week, how much does Dan earn per week?**	What is the value of n? $\frac{n}{3} = \frac{10}{5}$
Mike pours 4/9 quarts of milk equally in 4 mugs. How much milk is in each mug?	Multiply: $\frac{1}{2} \times 2\frac{1}{4} \times \frac{1}{6} =$	**Order the following from least to greatest:** $\frac{3}{7}$, 43%, 0.4, 0.04	Choose from the Problem Set!! 	**Add:** **2 + (-3) =** **(-2) + (-3)=** **(-2) + 3 =**
Choose from the Problem Set!! 	**If a person rolls two number cubes, what is the probability of getting five as a sum?**	**Calculate:** **7 x 8=** **(-7) x 8=** **(-7) x (-8)=**	**Which is the better price?** **a. 4 for $0.89** **b. 6 for $1.39**	**Bob works $1\frac{1}{2}$ hours per day and is paid $7 per hour. He works five days a week. How much money does he earn in 7 weeks?**

Get Ready for Grade 9 Choice Activities

1. Read a Cool Mathematics Book:

The Phantom Tollbooth by Norton Juster ***Math Curse*** by Jon Scieszka ***Chasing Vermeer*** by Blue Balliett ***All of the Above*** by Shelley Pearsall ***The Man Who Counted: A Collection of Mathematical Adventures*** by Malba Tahan	***The Number Devil*** by Hans Magnus Enzensberger ***Sir Cumference and the Dragon of Pi*** by Cindy Neuschwander ***Sir Cumference and the Sword in the Cone*** by Cindy Neuschwander
Find Mathematics Books to Read Online at Epic!: https://www.getepic.com/ Parents can sign up for free!	

2. **Use a cool mathematics website!**

http://illuminations.nctm.org http://www.shodor.org/interactivate/activities www.aaamath.com http://nlvm.usu.edu/en/nav/vlibrary.html https://www.youcubed.org/students/ https://www.firstinmath.com/	www.mathplayground.com www.funbrain.com https://www.khanacademy.org/ http://www.visualfractions.com/ https://www.prodigygame.com/

3. **Exercise your brain with a strategy game. A great way to have fun with friends and family! Some good games are listed below. Maybe you've got some favorites of your own!**

   - **Sequence**
   - **Chess**
   - **Dominoes**
   - **Blokus**
   - **Quirkle**
   - **Set**
   - **Settlers of Catan**
   - **Ticket to Ride**
   - **Mastermind**
   - **Go**

4. Take a free online course designed for learners of all levels of mathematics. Just follow the link below.

   Stanford Online

PROBLEM SET

Lesson 6: Algebraic Expressions—The Distributive Property

Classwork

Exercises

2. Using the numbers 1, 2, 3, 4 only once and the operations + or × as many times as you like, write an expression that evaluates to 16. Use this expression and any combination of those symbols as many times as you like to write an expression that evaluates to 816.

3. Define the rules of a game as follows:
   a. Begin by choosing an initial set of symbols, variable or numeric, as a starting set of expressions.

   b. Generate more expressions by placing any previously created expressions into the blanks of the addition operator: _____ + _____.

4. Roma says that collecting like terms can be seen as an application of the distributive property. Is writing $x + x = 2x$ an application of the distributive property?

5. Leela is convinced that $(a + b)^2 = a^2 + b^2$. Do you think she is right? Use a picture to illustrate your reasoning.

(114) Algebra 1 Module 1 Lesson 6 Video - YouTube

Lesson 8: Adding and Subtracting Polynomials

Classwork

Exercise 1

a. How many quarters, nickels, and pennies are needed to make $1.13?

b. Fill in the blanks:

$8{,}943 = \_\_\_\_\_ \times 1000 + \_\_\_\_\_ \times 100 + \_\_\_\_\_ \times 10 + \_\_\_\_\_ \times 1$

$= \_\_\_\_\_ \times 10^3 + \_\_\_\_\_ \times 10^2 + \_\_\_\_\_ \times 10 + \_\_\_\_\_ \times 1$

c. Fill in the blanks:

$8{,}943 = \_\_\_\_\_ \times 20^3 + \_\_\_\_\_ \times 20^2 + \_\_\_\_\_ \times 20 + \_\_\_\_\_ \times 1$

d. Fill in the blanks:

$113 = \_\_\_\_\_ \times 5^2 + \_\_\_\_\_ \times 5 + \_\_\_\_\_ \times 1$

Exercise 2

Now let's be as general as possible by not identifying which base we are in. Just call the base x.

Consider the expression $1 \cdot x^3 + 2 \cdot x^2 + 7 \cdot x + 3 \cdot 1$, or equivalently $x^3 + 2x^2 + 7x + 3$.

a. What is the value of this expression if $x = 10$?

b. What is the value of this expression if $x = 20$?

Exercise 3

a. When writing numbers in base 10, we only allow coefficients of 0 through 9. Why is that?

b. What is the value of $22x + 3$ when $x = 5$? How much money is 22 nickels and 3 pennies?

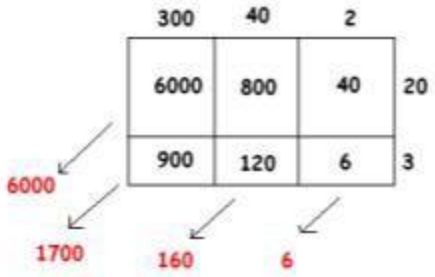
(114) Algebra 1 Module 1 Lesson 8 Video - YouTube

Lesson 9: Multiplying Polynomials

Classwork

Exercise 1

a. Gisella computed 342×23 as follows:



Can you explain what she is doing? What is her final answer?

Use a geometric diagram to compute the following products:

b. $(3x^2 + 4x + 2)(2x + 3)$

c. $(2x^2 + 10x + 1)(x^2 + x + 1)$

d. $(x - 1)(x^3 + 6x^2 - 5)$

Exercise 2

Multiply the polynomials using the distributive property: $(3x^2 + x - 1)(x^4 - 2x + 1)$.

Exercise 3

The expression $10x^2 + 6x^3$ is the result of applying the distributive property to the expression $2x^2(5 + 3x)$. It is also the result of applying the distributive property to $2(5x^2 + 3x^3)$ or to $x(10x + 6x^2)$, for example, or even to $1 \cdot (10x^2 + 6x^3)$.

For (a) to (j) below, write down an expression such that if you applied the distributive property to your expression, it would give the result presented. Give interesting answers!

a. $6a + 14a^2$

c. $6z^2 - 15z$

d. $42w^3 - 14w + 77w^5$

e. $z^2(a + b) + z^3(a + b)$

f. $\frac{3}{2}s^2 + \frac{1}{2}$

g. $15p^3r^4 - 6p^2r^5 + 9p^4r^2 + 3\sqrt{2}p^3r^6$

h. $0.4x^9 - 40x^8$

Exercise 2

Consider the equation $x^2 + 1 = 7 - x$.

a. Verify that this has the solution set $\{-3, 2\}$. Draw this solution set as a graph on the number line. We will later learn how to show that these happen to be the ONLY solutions to this equation.

b. Let's add 4 to both sides of the equation and consider the new equation $x^2 + 5 = 11 - x$. Verify 2 and -3 are still solutions.

c. Let's now add x to both sides of the equation and consider the new equation $x^2 + 5 + x = 11$. Are 2 and -3 still solutions?

d. Let's add -5 to both sides of the equation and consider the new equation $x^2 + x = 6$. Are 2 and -3 still solutions?

e. Let's multiply both sides by $\frac{1}{6}$ to get $\frac{x^2+x}{6} = 1$. Are 2 and -3 still solutions?

f. Let's go back to part (d) and add $3x^3$ to both sides of the equation and consider the new equation $x^2 + x + 3x^3 = 6 + 3x^3$. Are 2 and -3 still solutions?

2. Solve the equation for x. For each step, describe the operation used to convert the equation.

$$3x - [8 - 3(x - 1)] = x + 19$$

3. Solve each equation for x. For each step, describe the operation used to convert the equation.

a. $7x - [4x - 3(x - 1)] = x + 12$

b. $2[2(3 - 5x) + 4] = 5[2(3 - 3x) + 2]$

c. $\frac{1}{2}(18 - 5x) = \frac{1}{3}(6 - 4x)$

(114) Algebra 1 Module 1 Lesson 13 Video - YouTube

Example 1

What is the solution set to the inequality $5q + 10 > 20$? Express the solution set in words, in set notation, and graphically on the number line.

Exercises 2–3

2. Find the solution set to each inequality. Express the solution in set notation and graphically on the number line.

   a. $x + 4 \leq 7$ b. $\frac{m}{3} + 8 \neq 9$ c. $8y + 4 < 7y - 2$

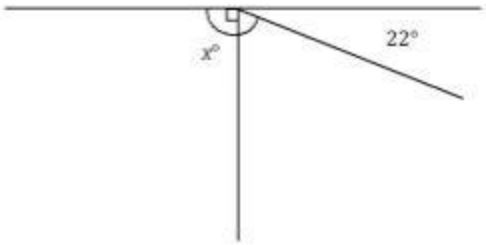
3. Recall the discussion on all the strange ideas for what could be done to both sides of an equation. Let's explore some of the same issues here but with inequalities. Recall, in this lesson, we have established that adding (or subtracting) and multiplying through by positive quantities does not change the solution set of an inequality. We've made no comment about other operations.

   a. Squaring: Do $B \leq 6$ and $B^2 \leq 36$ have the same solution set? If not, give an example of a number that is in one solution set but not the other.

   b. Multiplying through by a negative number: Do $5 - C > 2$ and $-5 + C > -2$ have the same solution set? If not, give an example of a number that is in one solution set but not the other.

Exercise 1

1. In a complete sentence, describe the relevant angle relationships in the diagram. Write an equation for the angle relationship shown in the figure and solve for x. Confirm your answers by measuring the angle with a protractor.



Example 1

The measures of two supplementary angles are in the ratio of 2: 3. Find the measurements of the two angles.

Exercises 2–4

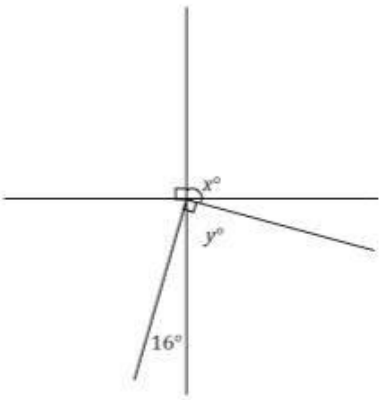
2. In a pair of complementary angles, the measurement of the larger angle is three times that of the smaller angle. Find the measurements of the two angles.

3. The measure of a supplement of an angle is 6° more than twice the measure of the angle. Find the measurement of the two angles.

4. The measure of a complement of an angle is 32° more than three times the angle. Find the measurement of the two angles.

Example 2

Two lines meet at a point that is also the vertex of an angle. Set up and solve an appropriate equation for x and y.

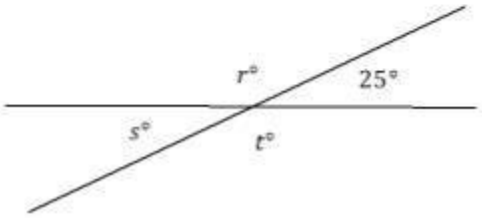


Lesson 2: Solving for Unknown Angles Using Equations

Classwork

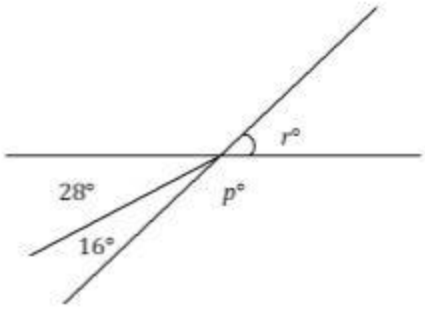
Opening Exercise

Two lines meet at a point. In a complete sentence, describe the relevant angle relationships in the diagram. Find the values of r, s, and t.



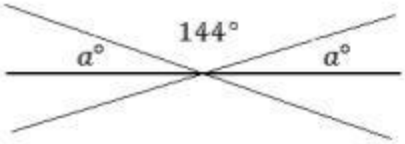
Example 1

Two lines meet at a point that is also the endpoint of a ray. In a complete sentence, describe the relevant angle relationships in the diagram. Set up and solve an equation to find the value of p and r.



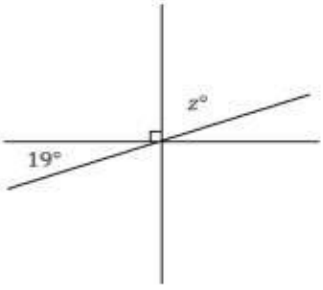
Exercise 1

Three lines meet at a point. In a complete sentence, describe the relevant angle relationship in the diagram. Set up and solve an equation to find the value of a.



Example 2

Three lines meet at a point. In a complete sentence, describe the relevant angle relationships in the diagram. Set up and solve an equation to find the value of z.



Lesson 21: Mathematical Area Problems

Classwork

Opening Exercise

Patty is interested in expanding her backyard garden. Currently, the garden plot has a length of 4 ft. and a width of 3 ft.

a. What is the current area of the garden?

Patty plans on extending the length of the plot by 3 ft. and the width by 2 ft.

b. What will the new dimensions of the garden be? What will the new area of the garden be?

c. Draw a diagram that shows the change in dimension and area of Patty's garden as she expands it. The diagram should show the original garden as well as the expanded garden.

d. Based on your diagram, can the area of the garden be found in a way other than by multiplying the length by the width?

e. Based on your diagram, how would the area of the original garden change if only the length increased by 3 ft.? By how much would the area increase?

f. How would the area of the original garden change if only the width increased by 2 ft.? By how much would the area increase?