Getting Ready for Algebra 1

- 1. Evaluating Expressions
- 2. Order of Operations
- 3. Writing Expressions
- 4. Writing Equations and Inequalities
- 5. Use a Problem Solving Plan
- 6. Precision and Measurement
- 7. Representing Functions as Rules and Tables
- 8. Representing Functions as Graphs

Evaluating Expressions

Evaluate $6 - n$ when $n = 4$.					
6 - n = 6 - 4	Substitute 4 for n				
= 2	Simplify				
Evaluate the expression.					
1. $3 + x$ when $x = 3$	13	5. z^2 when $z = 20$			

2. y - 2 when y = 18

6. b^3 when b = 0.1

3. $\frac{20}{k}$ when k = 2

7. $p^2 + m$ when m = 1 and p = 5

4. 40w when w = 0.5

8. z(x + y) when x = 6, y = 8 and z = 5

9. $(6+h^2-j) \div 2$ when h = 6 and j = 4

11. A base of a box has the shape of a square with an edge length of 5 inches. What is the area of the base of the box?

10. $y - (z + z^2)$ when y = 10 and z = 2

Order of Operations

	Parentheses	Exponents	Multiply or Divide	Add or Subtract		
	()	\sqrt{x} or x^2	× or ÷	+ or -		
E١	valuate $(5+3)^2 \div$	$2 \times 3.$				
	$= (8)^2 \div 2 \times 3$ Add within the parentheses					
	$= 64 \div 2 \times 3$ Evaluate the power					
	= 32 ×	3 Divide				
	= 9	6 Multiply				

Evaluate the expression.

1. $12 - 6 \div 2$

4. $15 - (4 + 3^2)$

2. $1 + 2 \cdot 9^2$

5. $\frac{20-}{5^2-1}$

3. $3 + 2^3 - 6 \div 2$

6. $50 - [7 + (3^2 \div 2)]$

7.
$$\frac{45}{8(5-4)-3}$$

Evaluate the expression with x = 4.

10. 15*x* – 8

8. $(8+5) \times \frac{35}{5} + 6$

11. $3x^2 + 4$

9. $9 \div 3 \times 2 - 6 + 2$

12. $2(x-1)^2$

Writing Expressions

Word Phrase	Operation	Write each as ar
more than/increased by/sum	Addition	
less than/decreased by/difference	Subtraction	Ex 1 – the produc
times/product	Multiplication	
Quotient	Division	
Quantity	Parentheses	Ex 2 – x increase
write each as an algebraic expres	sion.	

1. the sum of *k* and 7

n algebraic expression.

ct of 5 and a number

5n

ed by 6

x + 6

5. the difference of half of a number *b* and 4

2. 5 less than a number *z*

3. the quotient of a number *n* and 12

6. the quotient of a number *g* cubed and 5

7. five times the quantity of three more than a number y

4. three times the square of a number *x*

8. the product of twice a number *p* and 7

Write each as a verbal expression.

9. $\frac{x}{7}$

 $12.b^2 + 3$

10. *n* – 14

13.3*x*

11. 2*a* + 9

14.*w*³

Writing Equations and Inequalities

Word Phrase	Operation
is more than	>
is less than	<
is at least/is no less than	>
is at most/is no more than	<
is	=

Write the equation or inequality.

Ex 1 – the product of 5 and x is 40

5x = 40

Ex 2 - x sum of 3 and twice a number k is no more than 15.

 $3+2k\leq 15$

Write the equation or inequality.

- 1. The product of a number z and 12 is 60.
- 4. The quotient of a number *y* and 5 is at least 48.

- 2. The sum of 13 and a number is at least 24.
- 5. Seven less than *t* is at most 16.

- 3. The difference of a number *x* and 11 is greater than 37.
- 6. The product of a number *b* and 3 is no less than 12.

7. A number *k* cubed is less than 15.

9. 16 decreased by triple a number *d* is no more than 22.

8. The quotient of twice a number *r* and 5 is 12.

10.17 more than the product of 6 and a number *c* is 130.

Example – A rectangular banner is 12 feet long and has an area of 60 square feet. What is the perimeter of the banner?

Step 1 (Read and understand): You know the length of the rectangular banner and its area. You want to find the perimeter.

Step 2 (Make a Plan): Use the area formula for a rectangle to find the width. Then use the perimeter formula for a rectangle.

Step 3 (Solve the Problem): Substituting 12 for ℓ in the formula $A = \ell w$, 60 = 12w. Because $12 \cdot 5 = 60$, w = 5. Then substituting 12 for ℓ and 5 for w in the formula $P = 2\ell + 2w$, P = 2(12) + 2(5) = 34 feet.

Step 4 (Look Back): Use estimation. Since $\ell \approx 10$ and A = 60, w = 6. Then, $P \approx 2(10) + 2(6) = 32$ feet, so your answer is reasonable.

For problems 1 and 2, identify what you know and what you need to find out. You do not need to solve the problem.

1. You are making cookies for a bake sale and need to make enough cookies to fill 24 boxes containing 6 cookies each. How many dozen cookies do you need to make?

2. The cellular phone plan you signed up for gives you 400 minutes a month for \$35 and charges \$0.15 for each additional minute over 400 minutes. How long can you talk on the phone each month and stay within a budget of \$45?

For problems 3 and 4, state the formula that is needed to solve the problem. You do not need to solve the problem.

3. You invest \$200 into a savings account that earns 2% simple interest. How long will it take to earn \$50 in interest?

4. It takes you half an hour to travel 26 miles to work. What is your average speed?

- 5. Your sticker collection consists of 175 stickers. Each sticker is either an animated cartoon character or an animal. There are 43 less stickers that are animated characters than stickers that are animals. Let *x* be the number of stickers that are animals. Which equation correctly models this situation?
 - A. x 43 = 175B. x + (x + 43) = 175C. x + (x - 43) = 175
- 6. You installed a bookshelf on the wall to organize some of your books. The books that you absolutely want on the shelf weigh a total of $6\frac{3}{4}$ pounds. The bookshelf can handle no more than 9 pounds. You plan on filling the rest of the shelf with your paperbacks that each weigh about $\frac{1}{8}$ pound. Assuming you won't run out of room, how many paperback books can you add to the shelf?

7. You are responsible for buying supplies for an upcoming camping trip. You can buy packages of stew that just need water added and then are heated. Each package costs \$4.95 and contains enough stew for 2 people. You need to buy enough packages so that you can have stew for 3 days of the trip. There will be 8 people on the trip. How many packages do you need? What is the total cost?

Precision and Measurement

Significant Digits Rules:	Indicate the number of significant digits.
 Non-zero digits (between 1 and 9) are significant. Interior zeros between two non-zero digits are significant. Leading zeros to the left of the first non-zero digit are not significant. Trailing zeros to the right are significant if a decimal is present in the number. When adding/subtracting/multiplying/dividing, the answer should have the same number of significant digits as the limiting term. 	Ex $1 - 246.32$ 5 significant digits Ex $2 - 0.67$ 2 significant digits Calculate the answers with the appropriate number of significant digits. Ex $3 - 23.7 \times 3.8$ $23.7 \times 3.8 = 90.06$ 2 significant digits \rightarrow Answer = 90.
Indicate the number of significant digits.	
1. 1.008	5. 100.3
2. 700,000	6. 34.56
3. 350.670	7. 300.
4. 0.00340	8. 320,001

Calculate the answers with the appropriate number of significant digits.

9. 17.12 +30.123	12. 0.1700 x 1700. X 1700

10. 35.010 ÷ 1.23

13. 15.05 + 0.0044 + 12.34

11. 1000.00 - 62.5

14. 6.47 x 64.5

Representing Functions as Rules and Tables

The domain of the function y = 3x - 5 is 2, 3, 4, and 5. Make a table for the function, then identify the range of the function. 2 3 4 5 х y = 3x - 53(2) - 5 = 13(3) - 5 = 43(4) - 5 = 73(5) - 5 = 10The range of the function is 1, 4, 7, and 10.

Complete the sentence.

- 1. The input variable is called the ______ variable.
- 2. The output variable is called the ______ variable.

Tell whether the pairing is a fuction.

3.	Input	Output
	1	15
	3	20
	5	15
	7	20

4.	Input	Output
	5	5
	6	5
	7	6
	8	7





Make a table for the function. Identify the range of the function.

6. y = 4x - 2; Domain: 1,2,3,4

7.
$$y = \frac{1}{2}x + 2$$
; Domain: 6,7,8,9

Write a rule for the function.

8.	Input, x	1	2	3	4
	Output, y	5	10	15	20

9.	Input, x	10	11	12	13
	Output, y	3	4	5	6

10. The table shows men's shoe sizes in the United States and Australia. Write a rule for the Australian size as a function of the United State's size.

U.S. size	5	6	7	8	9	10
Australian size	3	4	5	6	7	8

Write a rule for the function represented by the graph. Identify the domain and the range of the function.



A rule for the function is $y = \frac{1}{2}x + \frac{1}{2}$. The domain is 1, 3, 5, and 7. The range is 1, 2, 3, and 4.

Graph the ordered pairs.

1. (3, 4), (4, 7), (5, 10), (6, 13), (7, 16)



Complete the input-output table for the function.

2.
$$y = 3x + 2$$

x	0	1	2	3
У				

Graph the function.

3. *y* = 6 − *x* Domain: 6, 5, 4, 3, 2

-6-	y				
-5-					
-4-					
-3-					
-2-					\square
-1-					\square
1		-	2	-	Ŧ

4. *y* = 4*x* − 3 Domain: 1, 2, 3, 4, 5

18-	y				
15-					
12-					
-9-					
-6-		-		\vdash	
-3-				\vdash	
6		,	2		s x

Write a rule for the function represented by the graph. Identify the domain and range of the function.

5.	12 ⁴ y
	12
	10
	-8
	-6
	-4
	-2
	0, 1 2 3 4 5 6 x

6.	A Y
	6
	2
	0 3 6 9 12 15 18 x

7	
'	•

-6-	y					
5-						
-4-						
-3.						
2						
-ĩ-						
_						
0	(1	2	3 4	5	6	5 x