Name: _____

Write your questions here!

3.3 Writing Two Step Equations

Introduction to Arithmetic Sequences

Warm Up:

What is repeated addition?

Example:

On your own Activity

What is $11+11+11+11+11+11$?

Sequences: _____

The 2 types of sequences that we will learn about in algebra 1 are

_____ & _____ sequences.

Arithmetic Sequences:

_____

_____

Ex. -6, 1, 8, 15, 22

Ex. $70,60,50,40,30,...$

What is the common difference of this Arithmetic sequence?

What is the common difference of this Arithmetic sequence?

Explore You have already saved \$60. You plan to save \$5 each week until you have \$100.

Guess

Too Low	Official Guess	Too High

Plan Organize the data for the first few weeks in a table. Notice the pattern.

# of Weeks	Cost		
0		=	
1		=	
2		=	
3		=	
4		=	
w		=	

Write an equation to represent the situation.

Let x = the number of weeks.

\$5 each week for x weeks plus amount already saved equals \$100.

Solve

You will need to save \$5 each week for _____ weeks.

Examine If you save \$5 each week for _____ weeks, you'll have an additional \$40. The answer appears to be _____.

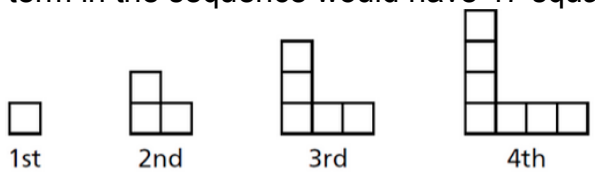
ALGEBRA

Write your questions here!

Write Equations Using Tables

Geometry example

Explore What term in the sequence would have 47 squares?



Guess

Too Low	Official Guess	Too High

Plan Organize the data for the first few terms in a table. Notice the pattern.

Term	Number of Squares		
1		=	
2		=	
3		=	
4		=	
5		=	
t		=	

Write an equation to represent the situation.

Let t = term # in the sequence.

Solve

There will be 47 squares in the _____ term in the sequence.

Examine The answer appears to be _____.

ALGEBRA

Write your questions here!

Write Equations Using Tables

Arithmetic Sequence example

Explore What term in the arithmetic sequence below is the value 9?

$$234, 229, 224, 219, \ldots.$$

Guess

Too Low	Official Guess	Too High

Plan Organize the data for the first few terms in a table. Notice the pattern.

Term			Value
1		=	234
2		=	229
3		=	224
4		=	219
5		=	
x		=	9

Write an equation to represent the situation.

Let t = term # in the sequence.

Solve

The value of the _____ term is 9.

Examine The answer appears to be _____.

Now, summarize your notes here!

3.3 Interactive Problem Set

1. What is an arithmetic sequence? How can your recognize one?

Determine if the sequence is arithmetic. If it is, find the common difference.

2. 7,10,13,16,..

Yes or No

Common Diff =

3. 3,12,48,...

Yes or No

Common Diff =

4. 19,16,13,10,7,...

Yes or No

Common Diff =

5. 1,–2,4,–8,...

Yes or No

Common Diff =

6. 17,12,8,3,–2...

Yes or No

Common Diff =

7. 625, 125, 25, 5, 1, . . .

Yes or No

Common Diff =

8. 4, 10, 18, 28, 40, . . .

Yes or No

Common Diff =

9. 8, 5, 3, 1, -1 . . .

Yes or No

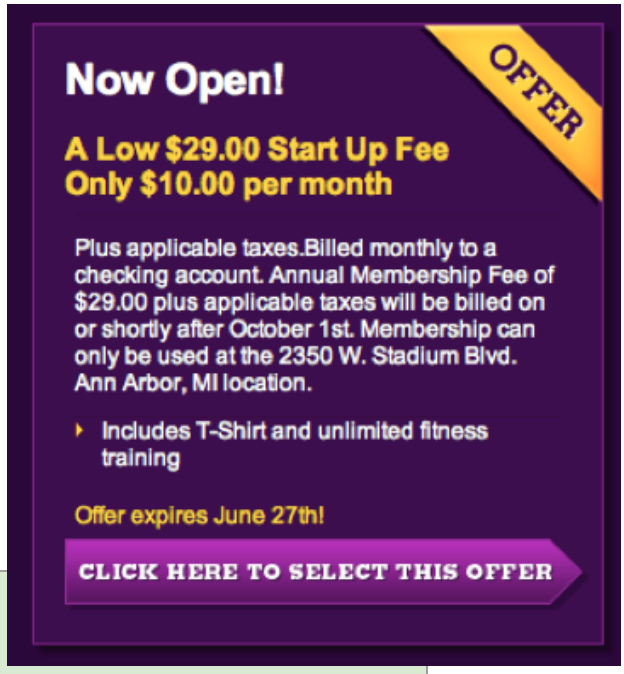
Common Diff =

10. 4, 8, 16, 22, 32, . . .

Yes or No

Common Diff =

Gym Membership Example



Explore **11.** How many months of membership could you get for $400?

Guess

Too Low	Official Guess	Too High

Plan Organize the data for the first few months in a table. Notice the pattern.

# of Months	Cost		
1		=	
2		=	
3		=	
4		=	
5		=	
m		=	

How long would a year membership cost?

Write an equation to represent the situation.

Let t = term # in the sequence.

Solve

For $400 you can get _____ months of gym membership.

Examine The answer appears to be _____.

Write equations for the following arithmetic sequences.

Explore

12. In order to join an online learning community, there is a $20 startup fee and a $5 monthly fee. If you have paid $70 for the online learning community, how many months have passed?

Guess

Too Low	Official Guess	Too High

Plan

Organize the data for the first few months in a table. Notice the pattern.

# of Months	Cost		
1		=	
2		=	
3		=	
4		=	
5		=	
		=	
x		=	

Solve

Equation: _____

Examine

Does the answer appear to be reasonable?

Write equations for the following arithmetic sequences.

Explore

13. Crazy Taxi Video – *How much would it cost to travel 30 km?*

Guess

Too Low	Official Guess	Too High

Plan

Put labels on the table. Organize the data for the first few inputs in a table. Notice the pattern.

1		**=**	
2		**=**	
3		**=**	
4		**=**	
5		**=**	
		=	
x		**=**	

Solve

Equation: _____

Examine

Does the answer appear to be reasonable?

Write equations for the following arithmetic sequences.

Explore

14. Styrofoam Cups – How many cups will stack to the top of the doorframe?

Guess

Too Low	Official Guess	Too High

Plan

Put labels on the table. Organize the data for the first few inputs in a table. Notice the pattern.

1		**=**	
2		**=**	
3		**=**	
4		**=**	
5		**=**	
		=	
x		**=**	

Solve

Equation: _____

Examine

Does the answer appear to be reasonable?

Sequel

How many cups will stack to Mr. Stadel's height?

Too Low	Official Guess	Too High

Solve

Equation: _____

Examine

Does the answer appear to be reasonable?

Write equations for the following arithmetic sequences. Then answer the questions. (Make a table if necessary)

15. Suppose that a bike rents for $4 plus $1.50 per hour. How much would it cost to rent the bike for 8 hours? How many hours could you rent the bike for if you had $50?

16. In order to join a yoga club there is a $100 annual fee and a $5 fee for each class you attend. How many classes will you get for $200?

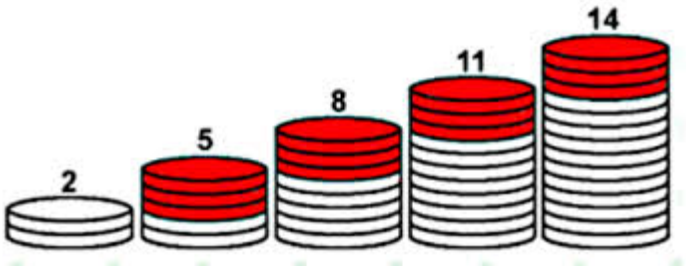
17. A plumber charges $75 for a service call plus $80 per hour of service. If the plumber is there for 3 hours, how much will it cost you? Your bill came out to $435, how many hours should the plumber have worked?

18. An attorney charges a fixed fee on $250 for an initial meeting and $150 per hour for all hours worked after that. The bill came out to $3700, how many hours were worked? Then, find the charge for 100 hours of work.

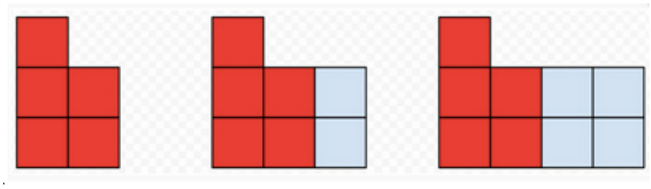
19. Rufus collected 100 pounds of aluminum cans to recycle. He plans to collect an additional 25 pounds each week. How long will it take Rufus to collect 400 pounds of cans?

Write an equation for the sequences below. Verify that your equation work by testing a few inputs.

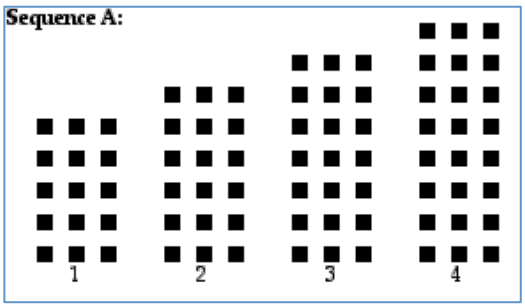
20. How many stacks of this pattern will it take for the final stack to be 185 pieces high?

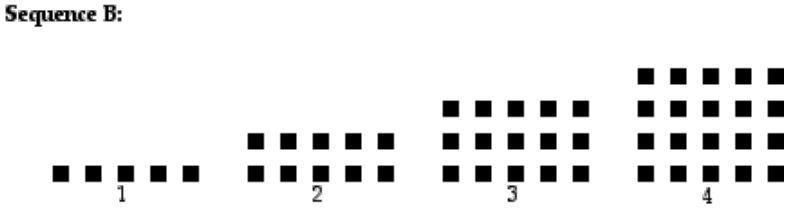


21. For what term in the sequence will it contain 115 squares?



22.





1. Which sequence will include more squares on the 13th term?

2. For what term in sequence A the number of square 45? How about for sequence B?

24. What term in the arithmetic sequence below is the value -77?

$4, 1, -2, -5, -8, \ldots$

Organize the data for the first few terms in a table. Notice the pattern.

Term			Value
1		=	
2		=	
3		=	
4		=	
5		=	
x		=	

What is the value of the 80^{th} term in the sequence?

25. What term in the arithmetic sequence below is the value 373?

$9, 23, 37, 51, 65, \ldots$

Organize the data for the first few terms in a table. Notice the pattern.

Term			Value
1		=	
2		=	
3		=	
4		=	
5		=	
x		=	373

What is the value of the 25^{th} term in the sequence?

26. What term in the arithmetic sequence below is the value 49.6?

1.6, 4, 6.4, 8.8, 11.2, . . .

Organize the data for the first few terms in a table. Notice the pattern.

Term			Value
1		=	
2		=	
3		=	
4		=	
5		=	
x		=	49.6

27. Use the arithmetic sequence below to answer the following questions:

12, 16, 20, 24, 28, ……

Hint: Make a table if you need to.

a) What term in the sequence has the value of 100?

b) What is the value of the 67^{th} in the sequence?

28.

$$d = r \cdot t$$

Two Moving Objects

Sometimes two objects travel to cover a certain distance. They either travel toward or away from each other, yet the combined distance is of importance.

To solve these types of problems, we should make a diagram to aid us in understanding what is happening. Here are two examples.

Example 1: *"Two skateboarders, Ron and Bob, are traveling in opposite directions. Ron travels at 8 feet per second and Bob travels at 10 feet per second. How long will it take before they are 2640 feet (1/2 mile) apart?"*

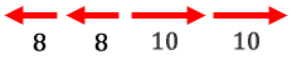
Solving Method 1:

Distance Rate Time Chart.

	Rate	Time	Distance
Skateboarder 1			
Skateboarder 2			
		Total:	

Solving Method 2:

Organize the data for the first few inputs in a table. Notice the pattern.

Input Time (Seconds)	Picture			**Output** Distance Apart (Feet)
1			**=**	
2			**=**	
3			**=**	
4			**=**	
5			**=**	
			=	
x			**=**	

Example 2: *"Two friends, Sherry and Fredrick, live 2000 miles apart. They want to meet each other and decided to both travel so that they can see each other sooner. If they both drive directly toward each other and Sherry travels at 50 mph and Fredrick travels at 60 mph, how much time will pass before they meet each other?"*

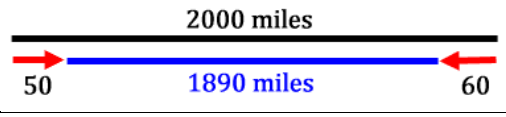
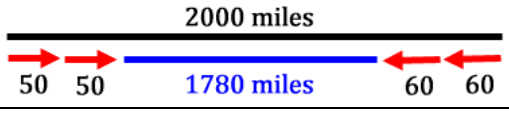
Solving Method 1:

Distance Rate Time Chart.

	Rate	Time	Distance
Sherry			
Fredrick			
		Total:	

Solving Method 2:

Organize the data for the first few inputs in a table. Notice the pattern.

Input Time (Hours)	Picture	**Output** Distance Apart (Miles)		
1			=	
2			=	
3			=	
4			=	
5			=	
			=	
x			=	

Try these two on your own on a separate sheet of paper
(Use one of the 2 methods previously mentioned)

1. Leann was traveling at 8 kilometers per second and Greg was traveling at 17 kilometers per second. They were traveling directly toward each other.

   How many seconds will it take for Leann to meet Greg if they are 225 kilometers apart?

2. Suzanne was traveling at 11 meters per hour and Wayne was traveling at 10 meters per hour. They were traveling directly away from each other.

   When will Suzanne and Wayne be 205 meters apart?

SKILLZ REVIEW		
1. $4\frac{2}{3}+(-5)$	2. $\left\|\frac{3}{5}+\left(-\frac{5}{6}\right)\right\|$	3. $\frac{2}{9}\div\left(-\frac{7}{5}\right)$
4. $-2\div\frac{3}{4}$	5. $-4(5x-3)$	6. $\frac{9z-6}{-3}$