

9.1H Arithmetic Sequences

Name: _____ Per: _____

SHOW YOUR WORK AND USE PENCIL.

1. Find each value for the following. Write your answers as fractions.

a. $3^3 =$

b. $3^2 =$

c. $3^1 =$

d. $3^0 =$

e. $3^{-1} =$

2. Write the values of the following functions in function notation.

a. **Example:** $f(x) = 2x$; find $f(1), f(2), f(3)$ and $f(10)$

c. $f(x) = 2^x$; find $f(1), f(2), f(3)$ and $f(10)$

$f(1) = 2, f(2) = 4, f(3) = 6, f(10) = 20$

b. $f(x) = \frac{1}{2}x + 1$; find $f(1), f(2), f(3)$ and $f(10)$

d. $f(x) = 2(x - 1) + 3$; find $f(1), f(2), f(3)$ and $f(10)$

3. Describe the change in each pattern below. Tell whether the representations below show an **arithmetic sequence**. Explain how you know. If it is arithmetic, write an equation to represent the pattern.

4. Write a 4-column table to show the growth for *b* above.

5. Complete each table. State the “*d*” (common difference) that shows how to find the next term. Write the **recursive equation** to find the next term and **explicit** equation to find any term. Find the 100th term.

Term	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th
Value	100	89	78	67				

a. *d*: _____ Recursive Eq: _____ Explicit Eq: _____ 100th term: _____

Term	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th
Value	36	50	64	78	2			

b. *d*: _____ Recursive Eq: _____ Explicit Eq: _____ 100th term: _____

Term	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th
Value	-300	-200	-100	0				

c. *d*: _____ Recursive Eq: _____ Explicit Eq: _____ 100th term: _____

6. Given a term from an **arithmetic sequence** and **common difference**, write the **explicit and recursive** equation

Ex. $f(1) = 28, d = 10$

a. $f(2) = 35, d = 4$

If $f(1) = 28$, then $f(0) = 18$. The y-int is (0, 18) and the slope = 10 ($d = 10$).

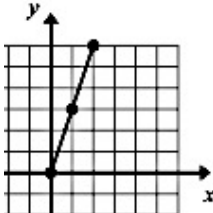
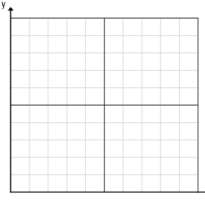
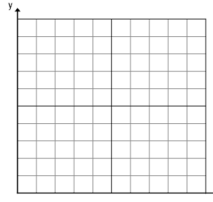
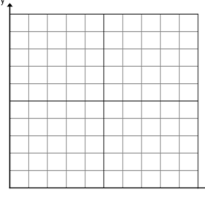
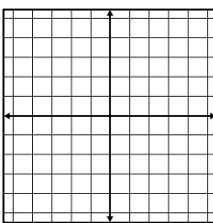
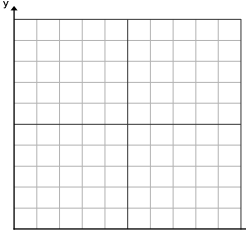
Recursive: $f(x) = f(x - 1) + 10$

Explicit: $f(x) = 10x + 18$

b. $f(2) = 39, d = -5$

c. $f(0) = -26, d = 200$

In each of the following problems has one representation of a function (situation/story, table, graph or equation). **Complete ALL the other three representations.**

<p>6. Story:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><th>x</th><th>$f(x)$</th></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>  <p style="text-align: right;">Equation: _____</p>	x	$f(x)$							<p>7. Story:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr><th>Time (hours)</th><th>Water (gallons)</th></tr> </thead> <tbody> <tr><td>0</td><td>1000</td></tr> <tr><td>1</td><td>800</td></tr> <tr><td>2</td><td>600</td></tr> <tr><td>3</td><td>400</td></tr> </tbody> </table>  <p style="text-align: right;">Equation: _____</p>	Time (hours)	Water (gallons)	0	1000	1	800	2	600	3	400		
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x	$f(x)$																				

Find the distance between and write the explicit equation for the line given the following points.

12. $(-15, 9), (-10, 4)$

13. Distance $(0.5, 4.5), (3, 3.5)$

14. $(50, 85), (60, 80)$

Distance: _____

Distance: _____

Distance: _____

Equation: _____

Equation: _____

Equation: _____

E.C. Midpoint: _____

E.C. Midpoint: _____

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15. Multiply the equations for #12 and #13 above.