

## Arithmetic Growth Assignment

1. State the common difference, then list the next three terms of each arithmetic sequence.

a) 12, 15, 18 ... (3)

21, 24, 27

b) 25, 21, 17 ... (-4)

13, 9, 5

c) 27, 37, 47 ... (10)

57, 67, 77

d) 31, 21, 11 ... (-10)

-1, -9, -19

e) -8, -5, -2 ... (3)

1, 4, 7

f) 1.8, 2.3, 2.8 ... (0.5)

3.3, 3.8, 4.3

2. Here is a pattern of natural numbers in three rows. Assume that the pattern continues.

Row 1            1, 4, 7, 10, 13

Row 2            2, 5, 8, 11, 14

Row 3            3, 6, 9, 12, 15

a) What are the next five numbers in row 2?

17, 20, 23, 26, 29

b) In which row will the number 100 appear?

Row 1

c) Describe a procedure you could use to determine in which list any given natural number appears. Test your procedure with some examples.

Subtract the first number, then divide by 3.

3. A sum of \$83 was deposited in a bank on Jan 1. A sum of \$20 is deposited in the bank on the 12<sup>th</sup> day of each month. Suppose this pattern continues. How much will be in the bank on Sept 1?

8 months

$$83 + 8(20) = \$243$$

4. The disappearance of the dinosaurs about 65 million years ago is one of the great mysteries of science. Scientists have recently found that mass extinctions of Earth's creatures are separated by periods of roughly 26 million years.

a) About when did other mass extinctions occur?

39 million yrs ago

b) Suppose the theory is correct. Estimate when the mass extinction might occur.

In 13 million years

5. Determine the indicated term of each arithmetic sequence.

a) i) 6, 11, 16 ... 7<sup>th</sup> term

21, 26, 31, 36

iv) 18, 15, 12 ... 8<sup>th</sup> term

$$18 + 7(-3) = -3$$

ii) 23, 34, 45 ... 10<sup>th</sup> term

$$23 + 9(11) = 122$$

v) 45, 37, 29 ... 9<sup>th</sup> term

$$45 + 8(-8) = -19$$

iii) 5, 10, 15 ... 12<sup>th</sup> term

$$5 + 11(5) = 60$$

vi) -10, -4, 2 ... 10<sup>th</sup> term

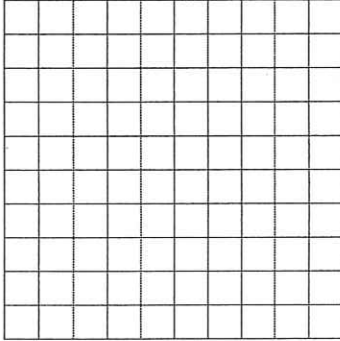
$$-10 + 9(6) = 44$$

b) Choose one sequence from part a. write to explain how you determined the term.

Found the common difference, then determined how many "jumps" there were between the first term and the one I was looking for.

6. The output of a northern gold mine has remained constant at 22,000 ounces per year. At the end of last year, the total output of the mine was 90,000 ounces of gold.
- a) What will the total output be at the end of this year? At the end of next year?

- b) Draw a graph to show the total output of the mine for the next five years.



- c) How would the graph change if the annual output is more than 22,000 ounces per year?

7. Complete each arithmetic sequence.

a) i) 2, 7, 12, 17, 22.

iv) 50, 45, 40, 35, 30.

ii) 37, 33, 29, 25, 21.

v) -18, -8, 2, 12, 22, 32

iii) 5, 13, 21, 29, 37.

vi) 43, 51.5, 60, 68.5, 77

- b) choose one sequence from part a. write to explain how you determine the missing terms.

*Found the common difference and then used it to find other numbers*

8. a) Insert two numbers between 8 and 30, so the four numbers form an arithmetic sequence.

*8,  $\frac{46}{3}$ ,  $\frac{68}{3}$ , 30*      $8 + 3d = 30, d = \frac{22}{3}$

- b) Insert three numbers between 10 and 55, so the five numbers form an arithmetic sequence.

*10,  $\frac{85}{4}$ ,  $\frac{65}{2}$ ,  $\frac{175}{4}$ , 55*      $10 + 4d = 55$   
 $d = \frac{45}{4}$

9. Determine the first five terms of each arithmetic sequence.

- a) The 2<sup>nd</sup> term is 14 and the 5<sup>th</sup> term is 23.

- b) The 3<sup>rd</sup> term is 35 and the 7<sup>th</sup> term is 55.

- c) The 5<sup>th</sup> term is 4 and the 8<sup>th</sup> term is -2.