Section 1 – Puzzles and Patters – Practice Test

1. Write the first four terms of each of the following sequences

a) $\{n^2 - 2\}$

b) $\left\{\frac{n+2}{n+1}\right\}$

c) $\{(-1)^{n+1}n^2\}$

d) $\left\{\frac{3^n}{2^n+1}\right\}$

2. Find the indicated arithmetic term.

a) $a = 5, d = 3; find\ t_{12}$

b) $a = 7, d = -5; find\ t_9$

c) $a = \frac{3}{4}, d = \frac{1}{2}; find\ t_{10}$

d) $a = 2.5, d = -1.5; find\ t_{20}$

3. Find the number of terms in each arithmetic sequence

a) $a = 6, d = -3,\ t_n = -30$

b) $a = -3, d = 5,\ t_n = 82$

c) $a = -3, d = 3, t_n = 108$

d) $a = 4, d = 7,\ t_n = 354$

4. Find the first term in the arithmetic sequence

a) $6th\ term\ is\ 10; 18th\ term\ is\ 46$

b) $4th\ term\ is\ 2; 18th\ term\ is\ 30$

c) $9th\ term\ is\ 23; 17th\ term\ is\ -1$

d) $5th\ term\ is\ 3; 25th\ term\ is\ -57$

5. Find x so that the values given are consecutive terms of an arithmetic sequence

a) $x+3, 2x+1, and\ 5x+2$

b) $2x, 3x+2, and\ 5x+3$

6. Identify the pattern and predict the next two numbers

a) $2, 5, 6, 9, 10, 13, 14, \ldots$

b) $1, -2, 4, -8, 16, \ldots$

7. Find the equation of the pattern listed below

a) $1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \ldots$

b) $1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \ldots$

c) $\frac{2}{3}, \frac{4}{9}, \frac{8}{27}, \frac{16}{81}, \ldots$

d) $2, -4, 6, -8$

8. Use deductive Reasoning to come up with conclusions to the following.

a) Premise

All Vic High students love Math
Talia is a Vic High student

Conclusion

b) Premise

It always rains on Tuesday
It is Tuesday today

c) Art, Bill, Cecil, and Don live in the same apartment.

They are a manager, teacher, artist, and musician.

Art and Cecil watch TV with the teacher.
Bill and Don go to the hockey game with the manager.
Cecil jogs with the manager and the teacher.

Who is the manager?

9. Solve the following puzzles.

If A, B, C, D are non-zero digits, find the numbers such that:

$$\begin{array}{r} A\ B\ C\ D \\ \times\ 4 \\ \hline D\ C\ B\ A \end{array}$$

There are three light switches in one room controlling three light bulbs, which you cannot see, in another room. You don't know which switch is connected to which bulb. You can make one guess to figure it out. How do you do it? (There is no one else around to help you out)

How has the course gone for you so far?