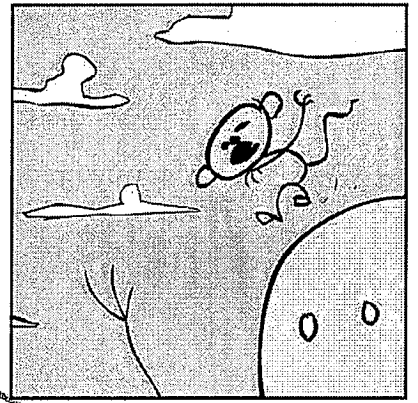


The Quiz of all Those Things...

Name _____



PART 2 — pick 3 (yes you can skip one ☺)

1) Find the next four terms..... 3, 4.3, 5.6

Handwritten calculations for problem 1:
 1.3 1.3 $\frac{1.3}{2}$ 6.9 8.2 9.5

2) Find the sum of the first 14, of series..... -30, -23, -16

Handwritten calculations for problem 2:
 $a_{14} = -30 + (14-1)7$
 $a_{14} = -30 + 13(7)$
 $a_{14} = 61$
 $S_{14} = \frac{14}{2} (-30 + a_{14})$
 $S_{14} = 7(-30 + 61)$
 $S_{14} = 7(31) = 217$

3) Find the 15th term of the geometric series where $a_1 = 2.2$ and $r = 2$

Handwritten calculations for problem 3:
 $S_n = \frac{a_1 - a_n r^n}{1 - r}$
 $a_n = a_1 r^{n-1} = 2.2(2)^{14} = 36044.8$
 $\frac{2.2 - 36044.8}{1 - 2} = \frac{-36042.6}{-1} = 36042.6$

4) What is the sum of the first nine terms of geometric series $1.2 + 2.4 + 4.8 + \dots$

Handwritten calculations for problem 4:
 $\frac{1.2 - 1.2(2)^9}{1 - 2} = \frac{1.2 - 307.2}{-1} = 306$
 $\frac{2.4}{1.2} = r = 2$

Part 3 — pick 2 (yes you can skip one ☺)

1) Each girl in this whacked family is taller by 1.5 inches. The youngest is 4'5". How tall is the tenth girl?

Handwritten calculations for problem 1:
 $r = 1.5$ $a_1 = 4.4^{5/2}$
 $\frac{4.4 - 4.4(1.5)^9}{1 - 1.5} = \frac{4.4 - 169.15}{-.5} = 329.5$
 Sheet inches vs feet...
 $53 - 53(1.5)^9 = 19845$
 $r = 1.5$ $a = 53$
 3968.99 inches
 330 feet
 numm..

6) The waiter noticed each tables bill was lessened 7 dollars. His first table was \$77. He decided to leave when his 20% tips got down to change. How many tables did it take?

Handwritten calculations for problem 6:
 $77 = a_1$ $d = 7$
 $.99 = \text{tip}$
 $4.95 = 77 + 7n - 7$
 $4.95 = 70 - 7n$
 $-65.05 = -7n$
 $9.3 = n$
 9.3 tables...
 $a_n = a_1 + (n-1)d$
 $4.95 = 77 + (n-1)7$
 $\frac{4.95}{.2} = .99$
 Δ
 4.95

7) I'm way tired. I get closer to sleep by 2% every minute. It is now 9:08 I am already 20% asleep. When will I be totally asleep?

$$a_1 = 20$$

$$a_n = 0$$

$$r = .02$$

$$a_n = a_1 r^{n-1}$$

$$0 = \frac{20}{20} \cdot \frac{20}{20} (.02)^{n-1}$$

$$0 = .02^{n-1}$$

$$\log 0 = \log .02^{n-1}$$

$$\log 0 = (n-1) \log .02$$

error = hmmm...

maybe it's arithmetic w/d

$$a_n = a_1 + (n-1)d$$

$$0 = 20 + (n-1) \cdot .02$$

$$-20 = .02n - .02$$

$$-19.98 = .02n$$

$$999 = N$$

minutes

16 1/2 hours

$$\begin{array}{r} 9:08 \\ + 16:30 \\ \hline 25:38 \end{array}$$

1:38

Part 4-

Write each expression in expanded form then find the sum.

1. 8

$$\sum_{n=1} (2n-1) = [2(1)-1] + [2(2)-1] + [2(3)-1]$$

2. 4

$$\sum_{p=0} 2^p$$

$$1 + 2 + 4 + 8 + 16 = 31$$

$$2^0 + 2^1 + 2^2 + 2^3$$

3. 5

$$\sum_{a=3} 4a$$

$$12 + 16 + 20 = 48$$

Part 2-

Express each series using sigma notation.

1. $5+8+11+14$

$$\sum_{n=2}^5 3(n)-1$$

2. $-8-12-16 \dots -40$

$$\sum_{n=2}^{10} -4n$$

3. $-2+4-8+16-32 \dots$

$$\sum_{n=1}^{\infty} -1^n (2)^n$$

Part....

$$1. \lim_{n \rightarrow \infty} \frac{2/n + 5n/n + 4n^{(2)}/n}{2n^{1/2}/n} = \text{No limit}$$

$$2. \lim_{n \rightarrow \infty} \frac{5n^{2/3} + 5n + 4}{2n^{3/2}} = \frac{5}{2}$$

4. OKAY.... Convergent or divergent

$$\frac{3 + 3^2 + 3^3 + 3^4}{1*2 \quad 1*2*3 \quad 1*2*3*4}$$

$$a_n = \frac{3^n}{n} \quad a_{n+1} = \frac{3^{(n+1)}}{n(n+1)}$$

$$\frac{3^{n+1}}{n(n+1)} \cdot \frac{n}{3^n} =$$

$$5. 1/5 + 2^2/5^2 + 3^3/5^3$$

$$a_n = \frac{n^2}{5^n}$$

$$a_{n+1} = \frac{(n+1)^2}{5^{(n+1)}}$$

$$\frac{(n+1)(n+1)}{5(n+1)} = \frac{5^{n+1}}{n^2}$$

$$r = \frac{3}{n+1} = \frac{0}{1}$$

CONVER

$$\frac{(n^2 + 2n + 1)}{5n^2} = \frac{1}{5} =$$

$$1/5 < 1$$

