Math 151 - Worksheet#09	Name (Print)	
Spring 2021	$\operatorname{RedID}$	
	Section $\#/TA$	

(P716#34) 1. Determine whether the series is convergent or divergent. If it is convergent, find its sum.  $\sum_{n=1}^{\infty} \frac{2^n + 4^n}{e^n}$ 

(P716#43) 2. Determine whether the series is convergent or divergent by expressing  $s_n$  as a telescoping sum. If it is convergent, find its sum.  $\sum_{n=2}^{\infty} \frac{2}{n^2 - 1}$ 

(P716#52) 3. Express the number as a ratio of integers.  $3.\overline{46} = 3.46464646...$ 

(P716#59) 4. Find the values of x for which the series converges. Find the sum of the series for those values of x.  $\sum_{n=0}^{\infty} \frac{(x-2)^n}{3^n}$ 

(P716#49) 5. Let x = 0.99999...

- (a) Do you think that x < 1 or x = 1?
- (b) Sum a geometric series to find the value of x.

- (P717#69) 6. A doctor prescribes a 100-mg antibiotic tablet to be taken every eight hours. Just before each tablet is taken, 20% of the drug remains in the body.
  - (a) How much of the drug is in the body just after the second tablet is taken? After the third tablet?
  - (b) If  $Q_n$  is the quantity of the antibiotic in the body just after the *n*th tablet is taken, find an equation that expresses  $Q_{n+1}$  in terms of  $Q_n$ .
  - (c) What quantity of the antibiotic remains in the body in the long run?

- (P717#70) 7. A patient is injected with a drug every 12 hours. Immediately before each injection, the concentration of the drug has been reduced by 90% and the new dose increases the concentration by 1.5 mg/L.
  - (a) What is the concentration after three doses?
  - (b) If  $C_n$  is the concentration after the *n*th dose, find a formula for  $C_n$  as a function of *n*.
  - (c) What is the limiting value of the concentration?

For more practice on these types of problems, try P717 #71,72.