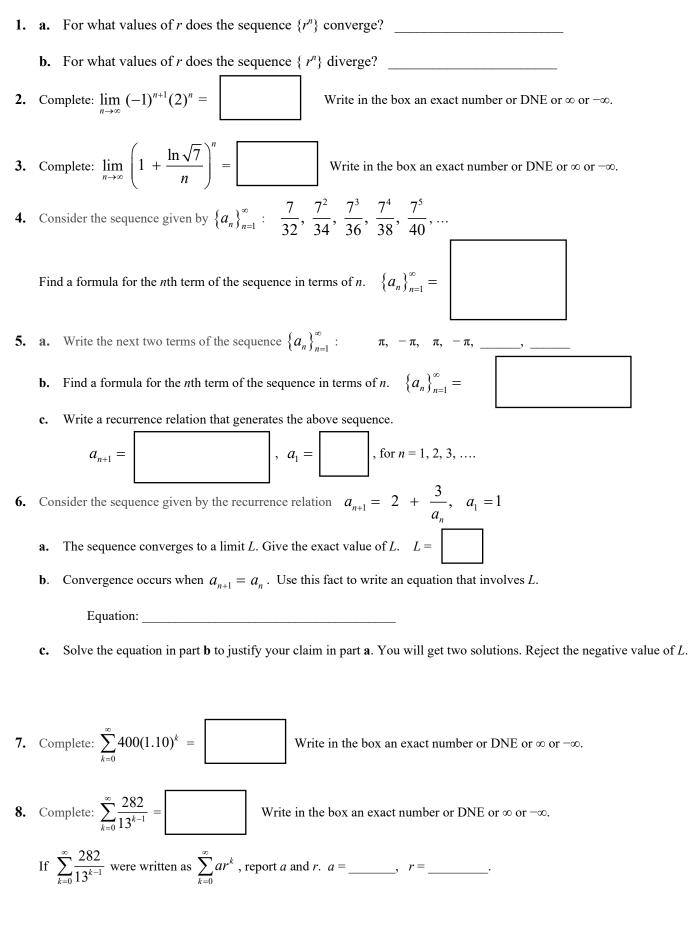
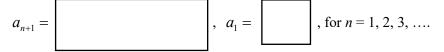
Practice Questions from Section 10.1 – 10.3



9. The series
$$\sum_{k=0}^{\infty} ar^k$$
 converges to 5. If $a = 9.5$, what is the value of r? Complete: $\sum_{k=0}^{\infty} 9.5 \left(\boxed{} \right)^k = 5$ Show work.

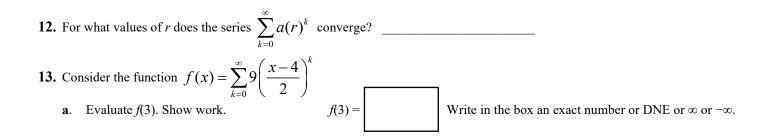
10. The series
$$\sum_{k=0}^{\infty} ar^k$$
 converges to 5. If $r = \frac{1}{25}$, what is the value of *a*? Complete: $\sum_{k=0}^{\infty} \left[\left(\frac{1}{25} \right)^k \right] = 5$
Show work.

- **11.** Consider the sequence $\sqrt{42}$, $\sqrt{42 \sqrt{42}}$, $\sqrt{42 \sqrt{42} \sqrt{42}}$, $\sqrt{42 \sqrt{42} \sqrt{42}}$,
 - **a.** Write a recurrence relation that generates the above sequence.

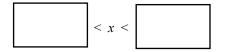


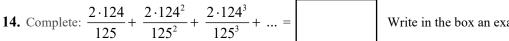
b. The sequence converges to a limit *L*. Give the exact value of *L*. L =

- c. Convergence occurs when $a_{n+1} = a_n$. Use this fact to rewrite the above recurrence relation into an equation that involves *L*. Equation:
- **d.** <u>Solve</u> the equation part **c** to justify your claim in part **b**.



b. For what values of x does f(x) converge? Show work.





Write in the box an exact number or DNE or ∞ or $-\infty$.

15. Consider the sequence given by the recurrence relation $a_{n+1} = 0.95a_n + 8.2$, $a_1 = 8.2$

- **a.** The sequence converges to a limit L. Give the exact value of L. L =
- **b**. Convergence occurs when $a_{n+1} = a_n$. Use this fact to rewrite the above recurrence relation into an equation that involves *L*.

Equation:

- c. *Solve* the equation in part b to justify your claim in part a.
- **d.** Complete the boxes below to write the next two terms of the series in long form. Each subsequent term involves a numerical expression containing 0.95 and 8.2.
 - 8.2 + + ...
- **e.** Without using sigma notation, write an expression that gives the *n*th partial sum of this series S_n = i.e., the sum of the series of *n* terms.
- **f.** Enter your expression from part **e** in your grapher and scroll a table to find the value of *n* for which the sum first surpasses 150.

The number of terms n =

16. Once per year Richie Rich deposits an amount of \$400 in an account which pays 10% interest per year, compounded annually, with <u>additional deposits of \$400 continually made at the end of the year</u>.

If B_n is the balance in the account, in dollars, immediately after Richie makes the *n*th deposit, then we can write $B_1 = 400 .

a. Complete the table to find the following. Report to the nearest \$0.01.

i) the balance, B₂, of the account on the day immediately after the second deposit.
ii) the balance, B₃, of the account on the day immediately after the third deposit.
iii) the balance, B₄, of the account on the day immediately after the fourth deposit.

b. Suppose Richie makes 422 deposits. Which is true about the sum B_{422} ? The balance, B_{422} , of the account on the day immediately after the 422nd deposit is exactly

A. $B_{422} = 400 \cdot 10^{422} + 400 \cdot 10^{421} + ... + 400 \cdot 10^2 + 400 \cdot 10 + 400$

- B. $B_{422} = 400 \cdot 1.10^{423} + 400 \cdot 1.10^{422} + ... + 400 \cdot 1.10^2 + 400 \cdot 1.10 + 400$
- C. $B_{422} = 400 \cdot 10^{423} + 400 \cdot 10^{422} + ... + 400 \cdot 10^2 + 400 \cdot 10 + 400$
- D. $B_{422} = 400 \cdot 1.10^{422} + 400 \cdot 1.10^{421} + ... + 400 \cdot 1.10^2 + 400 \cdot 1.10 + 400$
- E. $B_{422} = 400 \cdot 1.10^{421} + 400 \cdot 1.10^{420} + ... + 400 \cdot 1.10^2 + 400 \cdot 1.10 + 400$
- F. $B_{422} = 400 \cdot 10^{421} + 400 \cdot 10^{420} + ... + 400 \cdot 10^2 + 400 \cdot 10 + 400$
- c. The balance, B_{422} , of the account on the day immediately after the 422nd deposit is approximately A. $B_{422} \approx \$1291712354137103000000$
 - B. $B_{422} \approx \$1067530871187688000000$
 - C. $B_{422} \approx \$1174283958306457000000$
 - D. $B_{422} \approx \$1188774622351958700000$
 - $E. \quad B_{422} \approx \14490664045501680000
 - F. The value of B_{422} can not be computed.

n, # Deposits	B_n
1	\$400
2	
3	
4	

