

Name: _____

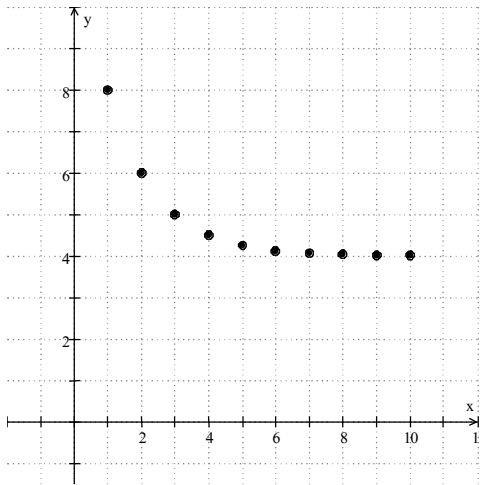
Date: _____

Intro to Limits Knowledge Check

1. State the limit of each sequence, if it exists. If it does not exist, explain why.

- a) $1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \dots$
- b) $2, 4, 6, 8, 10, \dots$
- c) $2.1, 2.01, 2.001, 2.0001, 2.00001, \dots$

2. State the limit of the sequence represented by the graph, if it exists. If it does not exist, explain why.



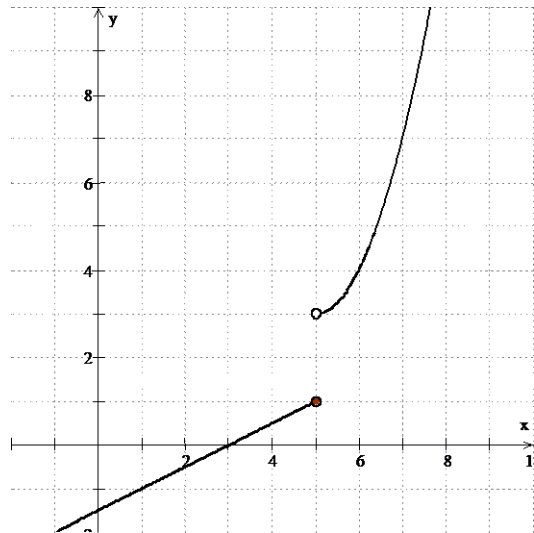
3. The general term of a particular infinite sequence is $1 - \left(\frac{1}{2}\right)^n$.

- a) Write the first six terms of the sequence.
- b) What is the limit of this sequence? Justify your answer.

4. The general term of a particular infinite sequence is $2n^2 - n$.

- a) Write the first six terms of the sequence.
- b) Explain why the limit of this sequence does not exist.

5. Examine the given graph and evaluate the following limits.



- a) $\lim_{x \rightarrow 5^-} f(x)$
- b) $\lim_{x \rightarrow 5^+} f(x)$
- c) $\lim_{x \rightarrow 5} f(x)$

6. Evaluate each limit, if it exists.

- a) $\lim_{x \rightarrow -1} (2x^2 + 4x - 5)$
- b) $\lim_{x \rightarrow 3} \left(\frac{2x^2 - 5}{x - 1} \right)$
- c) $\lim_{x \rightarrow 1} \left(\frac{5}{3x + 4} \right)$
- d) $\lim_{x \rightarrow 2} \left(\frac{x^2 - 4x + 3}{x - 1} \right)$

Answers

1. a) 0 b) limit does not exist – continues to infinity c) -2
2. a) 4 b) no limit – diverging
3. a) $\frac{1}{2}, \frac{3}{4}, \frac{7}{8}, \frac{15}{16}, \frac{31}{32}, \frac{63}{64}$ b) 1
4. a) 1, 6, 15, 28, 45, 66 b) the limit continues to grow
5. a) 1 b) 3 c) limit does not exist
6. a) -7 b) $\frac{13}{2}$ c) $\frac{5}{7}$ d) -1