MAT1505-03/04 17F Quiz 7   Print Name (Last, First) _____ , _____|____
Show all work, including mental steps, in a clearly organized way that speaks for itself. Use proper
mathematical notation, identifying expressions by their proper symbols (introducing them if necessary), and use
EQUAL SIGNS and arrows when appropriate. Always SIMPLIFY expressions. BOX final short answers.
LABEL parts of problem. Keep answers EXACT (but give decimal approximations for interpretation when
appropriate). Indicate where technology is used and what type (Maple, GC).

1. $a_n = \arctan\left(\dfrac{n^2}{4 + n^2}\right)$.

a) Show the evaluation of $A = \lim_{n \to \infty} a_n$.

b) Evaluate the decimal values of the first 20 terms on your favorite tech device, but don't bother listing them on
this sheet. Do these seem to confirm part a)? If so, at which term in the sequence (give n and a_n to 5 decimal

places) does the term get within 1 percent of the limiting value? If not, reconsider part a).

2. Find the sum of the series exactly and to 4 decimal places: $S = \displaystyle\sum_{n=1}^{\infty} \dfrac{(-3)^{n+1}}{2^{3n}}$. Support your work by

identifying the values of the two parameters needed for the relevant formula.

3. $\displaystyle\sum_{n=3}^{\infty} \dfrac{1}{n^5 - 5n^3 + 4n}$. Use Maple to find a formula for the nth partial sum of this infinite series, and then take

its limit to obtain the value of this series, and finally compare your exact result with Maple's value for the
infinite series.

▶ **solution**