

PART β EXAM III

NAME: _____

(Please Print)

(50 points and 4 pages)

SHOW ALL RELEVANT WORK. BE SURE ALL ANSWERS ARE SIMPLIFIED AND THAT ALL WORK IS LOGICAL. BOX YOUR ANSWER. NO CALCULATOR!!

[10] (1)

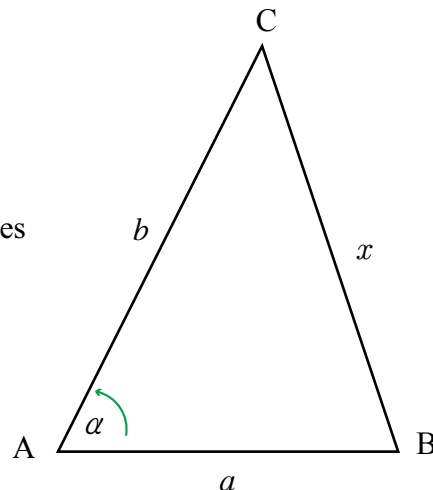
GIVEN: $\triangle ABC$

$$\begin{cases} AB = a = \sqrt{5} \\ AC = b = 3 \\ BC = x \\ m\angle BAC = \alpha = \tan^{-1} 2 \end{cases}$$

FIND: x

(Express x
as a simplified
algebraic number)

HINT: Use the Law of Cosines



[10] (2) GIVEN: $\frac{e^x}{e^x - 3} = 2$

FIND:

a) The set, Λ , so that

$$\frac{e^x}{e^x - 3} = 2 \iff x \in \Lambda.$$

b) Count the number of elements in Λ , $n(\Lambda)$.

[15] (3) PROVE the IDENTITY: $\frac{\cos x}{1 - \sin x} = \sec x + \tan x$

[15] (4)

GIVEN: $a_k = 2k + 1$

EVALUATE: $\sum_{k=1}^4 a_k$