Species Diversity

Understanding the Difference between Species Richness and Species Diversity
- Consider the following data from samples of organisms obtained from two different biological communities, A and B.

Community A

Species	# of individuals
A	59
B	12
C	11
D	10
E	5
F	3
Total	100

Community B

Species	# of individuals
A	21
B	20
C	19
D	14
E	13
F	13
Total	100

1. Calculate species richness for the two communities using the following equation $D = s / \sqrt{N}$
   - Where s equals the number of different species represented in your sample, and N equals the total number of individual organisms in the sample

2. Using the Shannon-Weiner Diversity Index equation, determine which community has the highest species diversity.
   - $H = -\sum (pi) \, |\ln pi|$
   - Where (pi) is the relative abundance of species "i" in the community (# of individuals in a species / total # of individuals

Community A

A	B	C	D	E	F	G
Species Name	# of Individuals	Total # of Individuals	Relative Abundance (Pi)	Natural log of Relative Abundance (ln Pi)	Relative Abundance X Natural log (Pi ln Pi)	Diversity Index
		= sum of B	= B/C	=ln D	= D x E	= sum of F
A						-------------
B						-------------
C						-------------
D						-------------
E						-------------
F						-------------

Multiply by -1 to make positive = Shannon-Wiener Diversity Index = _____

Community B

A	B	C	D	E	F	G
Species Name	# of Individuals	Total # of Individuals = sum of B	Relative Abundance (Pi) = B/C	Natural log of Relative Abundance (ln Pi) =ln D	Relative Abundance X Natural log (Pi ln Pi) = D x E	Diversity Index = sum of F
A						---------------
B						---------------
C						---------------
D						---------------
E						---------------
F						---------------

Multiply by -1 to make positive = Shannon-Wiener Diversity Index = _____

3. How does species richness and species diversity relate to each other?