I claim that we need to show that there is a process P and we need two distinct processes A1 which is not equal to A2 such that P -> A1 and P-> A2, and the relation is non-deterministic

Construction:
We define symbols:
0 (inaction)
xbar <yarrow>.P as the output tuple yarrow on channel x, which then continues as P
x(zarrow).P as the input tuple on channel x, which binds to zarrow, then continues as P)
P | A as the parallel composition
vx.P (name restriction)
!P (replication)

~ is silent action
P ~ -> P` is a transition

Proof:

We let P = abar<b>.0 | a(x).0 | a(x).0

This means that one output on a sends a name b. We have two input processes both waiting to receive some name on channel a.

Let R1 = the first a(x).0 and R2 = the second a(x).0

We have Pbar = abar<b>.0 | R1 | R2

Note that we need to use the communication rule of pi-calculus.

Now, Reduction 1:
As sender communicates with R1

P ~ -> 0 |0 | R2 ≡ Q1

Reduction 2:
Sender communicates with R2

P ~ -> 0 | R1| 0 ≡ Q2

Q1 neq Q2, this proves that the same process has atleast two distinct transitions.

This holds for the definition of nondeterminism, so the polyadic pi calculus is non-deterministic.