

Please type your answers into a fresh new document, with the problems clearly labelled and separated, so they are easy to grade. Do not try to cram your answers into the original homework PDF. Make sure you input any IPA symbols correctly. Check the resources on Quercus for tools that you can use for inputting IPA symbols.

Problem 1. Each of the following groups of IPA symbols represents consonant phones that have the same **place of articulation**, except one symbol which represents a consonant phone with a different place. For each group, (i) list which symbol doesn't belong, and (ii) list which place the group represents when the non-matching symbol is removed. [5 marks]

For example, if you are given {[d], [z], [k], [n]}, then you would list the symbol [k] and the place of articulation **alveolar**, because the remaining symbols represent alveolar phones, and [k] does not.

- {[h], [ʔ], [x], [ɦ]}
- {[ʃ], [ʒ], [q], [ç]}
- {[r], [ɹ], [r], [ɹ]}
- {[β], [f], [p], [m], [ϕ]}
- {[j], [c], [t], [ɲ], [ʎ]}

Problem 2. Each of the following groups of IPA symbols represents consonant phones that have the same **manner of articulation**, except one symbol which represents a consonant phone with a different manner. For each group, (i) list which symbol doesn't belong, and (ii) list which manner the group represents when the non-matching symbol is removed. [5 marks]

For example, if you are given {[h], [m], [v], [s]}, then you would list the symbol [m] and the manner of articulation **fricative**, because the remaining symbols represent fricatives, and [m] does not.

- {[l], [ɠ], [ʃ], [ʔ]}
- {[z], [ʎ], [ʎ], [l]}
- {[h], [ʔ], [x], [ɦ]}
- {[ɲ], [ŋ], [ɲ], [ɣ], [m]}
- {[w], [ɹ], [j], [ɹ], [ɹ]}

Problem 3. Each of the following groups of IPA symbols represents vowel phones that share have the same **height, backness, rounding, and tenseness**, except one symbol which represents a vowel phone with a different height, backness, rounding, or tenseness. For this problem, treat all low vowels as lax, and treat height as having only three levels (high, mid, low; ignore the difference in height between true high and near-high, etc.). For each group, (i) list which symbol doesn't belong, and (ii) list which value of height, backness, rounding, or tenseness the group represents when the non-matching symbols is removed. [5 marks]

For example, if you are given {[ɪ], [e], [ɔ], [ʊ]}, then you would list the symbol [e] and the articulatory property **lax**, because the remaining symbols represent lax vowels, and [e] does not.

- a. {[æ], [ə], [o], [ø]}
- b. {[ɒ], [y], [ə], [u]}
- c. {[a], [ʌ], [æ], [ɑ]}
- d. {[y], [e], [i], [o], [ʊ]}
- e. {[i], [o], [e], [æ], [œ]}

Problem 4. Across the world's spoken languages, vowel systems tend to follow certain patterns. Three important patterns are: (1) front and central vowels tend to be unrounded, while back vowels tend to be round; (2) low vowels tend to be unrounded, even if they are back; and (3) vowels tend to be fairly evenly spread apart in the vowel space to avoid crowding. Consider the following vowel systems for various languages. List the five languages whose vowel systems satisfy all three of these patterns. You may find it helpful to sketch out diagrams for the vowel systems to see how they are structured (you do not need to submit any such diagrams, just the names of the five languages). [5 marks]

Japanese	(Japonic family, Japan)	o u e i a
Alagwa	(Afro-Asiatic family, Tanzania)	u a i o e
Wari'	(Chapacuran family, Brazil)	ø i y a e o
Abelam	(Sepik family, Papua New Guinea)	i a ə
Shuswap	(Salishan family, Canada)	u ε a i ə ɔ
Finnish	(Uralic, Finland)	æ u ø ɑ i y e o
Dari	(Indo-European family, Afghanistan)	ʊ ɑ ε u a e i o
Jaqaru	(Aymaran family, Peru)	u i a
Nimboran	(Foja Range, Indonesia)	u i o a ʌ e
Uzbek	(Turkic family, Uzbekistan)	ɔ æ o e i u
Tumari Kanuri	(Nilo-Saharan, Niger)	i a u ʌ e o ə
Woleian	(Austroneasian family, Micronesia)	y o i œ u a e ɒ