

## Physics 140 – Week of September 17

---

### Reading

For 9/19 – R&P §3.2.

1. What is 53 in binary? What is 1101101 in decimal?
2. R&P state that entanglement depends on a decomposition into subsystems. What is a decomposition into subsystems?
3. What did you find difficult or confusing about the reading? If nothing was particularly difficult, what was most interesting? Please be as specific as possible.

For 9/21 – R&P §3.4.

1. Rewrite the Bell state  $|\Phi^+\rangle = \frac{1}{\sqrt{2}}(|00\rangle + |11\rangle)$  in the Hadamard basis. If Alice measures  $|+\rangle$  for her bit, what does Bob measure?
2. What did you find difficult or confusing about the reading? If nothing was particularly difficult, what was most interesting? Please be as specific as possible.

For 9/24 – R&P §4.1.

You all may have a funny experience reading this section. R&P assume that you've seen linear algebra and therefore the matrix description of linear transformations. They are trying to coax you into a new way of understanding them in terms of bra and ket vectors. I suspect for you all the bra and ket descriptions will go down easier. That's fine, because R&P will emphasize the bra and ket description through the rest of the text. I will explain the matrix business in class Monday.

1. In this section R&P introduce three different ways of describing linear transformations on vectors. What are they?
2. What did you find difficult or confusing about the reading? If nothing was particularly difficult, what was most interesting? Please be as specific as possible.

### Problems

- R&P 3.2, 3.5-3.8, 3.12, 3.15b

—

As a reminder, reading responses are due in my email inbox ([ekb2@stmarys-ca.edu](mailto:ekb2@stmarys-ca.edu)) at 9:00 p.m. the night before class. Problem sets are due Monday at 4:00 p.m., in the manila envelope outside my office.