1. Imagine a spin-1/2 system prepared in the state:

$$|\psi\rangle = \sqrt{\frac{2}{5}}\,|+\rangle + i\sqrt{\frac{3}{5}}\,|-\rangle$$

   Use a completeness relation to write this state in the $S_x$ basis.

2. Use a completeness relation to write $|-\rangle$ in the $S_y$ basis.