

**Student handout**

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.