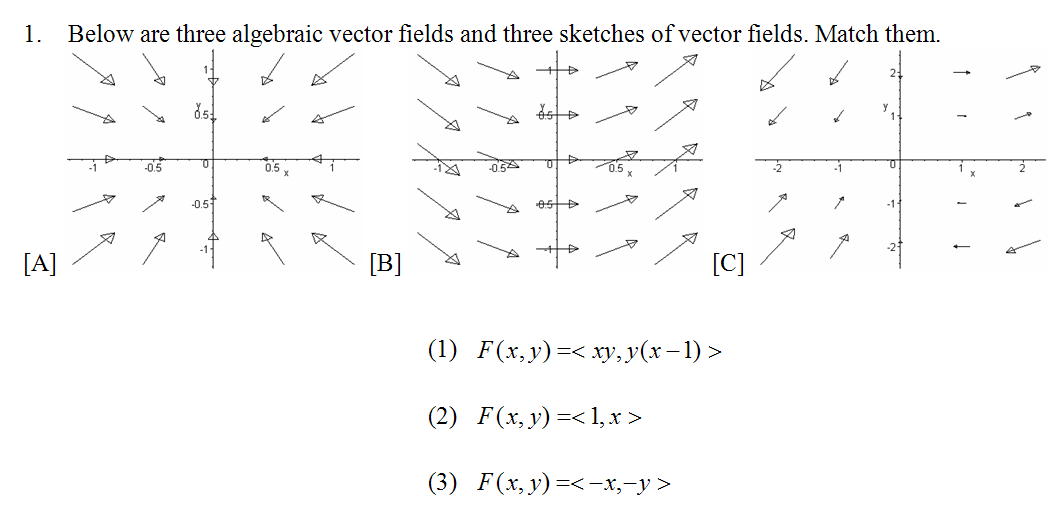
**Vector Fields and Line Integration**

Last time: , , , conservative vector field



**Theorem: (Conservative Vector Fields)**

If a vector field F is conservative, then . For a 2D vector field, this reduces to the condition . The converse is true in most cases (but not in general).

**Proof:**

**Example**: Which of the following vector fields are not conservative?



**Example:** Find the potential function, if there is one, for



Occasionally you can guess (and check) the potential function: The gravity field of an object at is:

Its potential function is: