MTH 255H **HW #3** Winter 2013

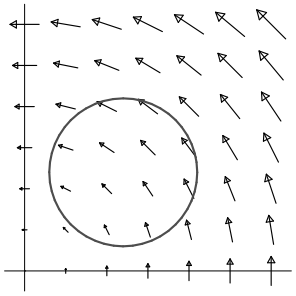
1. Sketch each of the vector fields below

(a) $\vec{\boldsymbol{G}} = x\,\hat{\boldsymbol{\imath}} + y\,\hat{\boldsymbol{\jmath}}$

(b) $\vec{\boldsymbol{H}} = y\,\hat{\boldsymbol{\imath}} - x\,\hat{\boldsymbol{\jmath}}$

(c) $\vec{\boldsymbol{F}} = y\,\hat{\boldsymbol{\imath}} + x\,\hat{\boldsymbol{\jmath}}$

2. Consider the vector field $\vec{\boldsymbol{F}}$ shown at the right.



(a) Which of the following formulas best fits $\vec{\boldsymbol{F}}$?

$$\vec{\boldsymbol{F}}_1 = \frac{x}{x^2+y^2}\,\hat{\boldsymbol{\imath}} + \frac{y}{x^2+y^2}\,\hat{\boldsymbol{\jmath}}$$

$$\vec{\boldsymbol{F}}_2 = -y\,\hat{\boldsymbol{\imath}} + x\,\hat{\boldsymbol{\jmath}}$$

$$\vec{\boldsymbol{F}}_3 = \frac{-y}{(x^2+y^2)^2}\,\hat{\boldsymbol{\imath}} + \frac{x}{(x^2+y^2)^2}\,\hat{\boldsymbol{\jmath}}$$