(c) $\bar{\nabla} h = (20y - 60x - 180)\hat{i} + (20x - 80y + 280)\hat{j}$

(at $x=1, y=1$

$\bar{\nabla} h = (20 - 60 - 180)\hat{i} + (20 - 80 + 280)\hat{j}$

$\bar{\nabla} h = -220\hat{i} + 220\hat{j}$

$|\bar{\nabla} h| = \sqrt{(-220)^2 + (220)^2} = 220\sqrt{2} = 311 \text{ ft/mile}$

direction (North west)