Quiz 5: So you read the exam solutions . . .

1. If you place a negatively charged particle in an electric field, the charge will move
   □ from higher to lower electric potential and from lower to higher potential energy.
   □ from higher to lower electric potential and from higher to lower potential energy.
   □ from lower to higher electric potential and from lower to higher potential energy.
   □ from lower to higher electric potential and from higher to lower potential energy.

2. A pyramid has a square base of side $a$, and four faces which are equilateral triangles. A charge $Q$ is placed on the center of the base of the pyramid. What is the net flux of electric field emerging from one of the triangular faces of the pyramid?
   □ Uncertain: we must know whether $Q$ is just above or below the base.
   □ 0
   □ $\frac{Q}{\varepsilon_0}$
   □ $\frac{Qa^2}{2\varepsilon_0}$
   □ $\frac{Q}{2\varepsilon_0}$

3. In a region of uniform electric field $\vec{E}$, a charged particle experiences an acceleration $\vec{a}$. If a second particle with four times the charge and twice the mass of the first particle enters that same region, it will experience an acceleration
   □ $\frac{1}{4}\vec{a}$
   □ $\frac{1}{2}\vec{a}$
   □ $\vec{a}$
   □ $2\vec{a}$
   □ $4\vec{a}$

4. A spherical balloon contains a positively charged object at its center. As the balloon is inflated to a greater volume while the charged object remains at the center, does the electric flux at the surface of the balloon:
   □ increase
   □ decrease
   □ remain the same

5. Two particles are separated by a distance of 3.0 m; each exerts an electric force of 1.0 N on the other. If one particle carries 10 times as much electric charge as the other, what is the magnitude of the smaller charge?
   □ 10 pC
   □ 10 µC
   □ 10 nC
   □ 10 kC