TMATH 126: Quiz 3

You may use:

- any kind of calculator that cannot access the internet and
- a double-sided 3×5" card for this quiz.

Show *all* your work (numerically, algebraically, or geometrically) for each and simplify. No credit is given without supporting work.

1. [6] TRUE/FALSE: Circle T in each of the following cases if the statement is *always* true and provide a brief justification. Otherwise, circle F and provide a counterexample.

   T   F   If $\vec{a}$ and $\vec{b}$ are vectors, then $\vec{a}$ is parallel to $\vec{b}$ if and only if $\vec{a} \cdot \vec{b} = 1$.
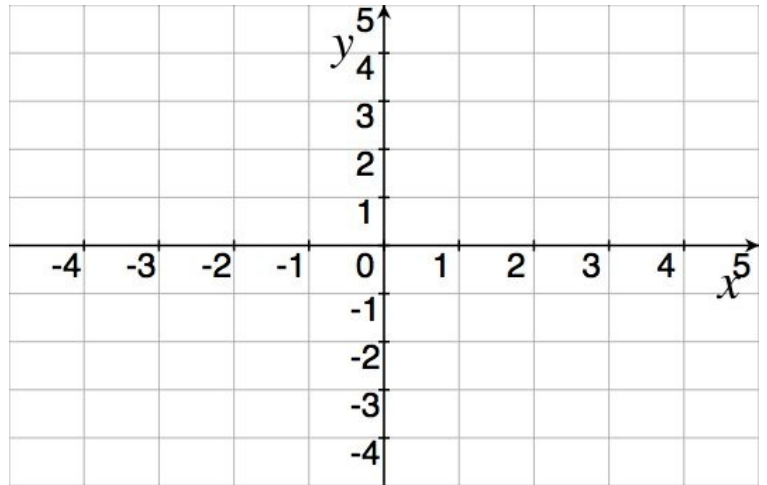
   T   F   The volume of a parallelepiped with edges $\overline{PQ}$, $\overline{PR}$ and $\overline{PS}$ can be found by computing $(\overrightarrow{PQ} \cdot \overrightarrow{PR}) \times \overrightarrow{PS}$.

2. [3] (§12.1 #36) Write the equation(s) for the three dimensional figure (and its contour lines) shown below.
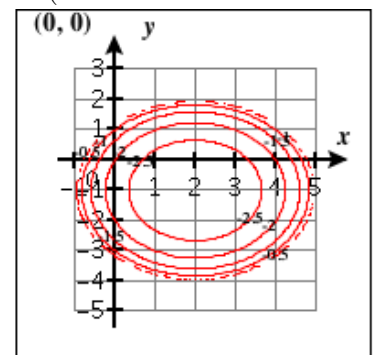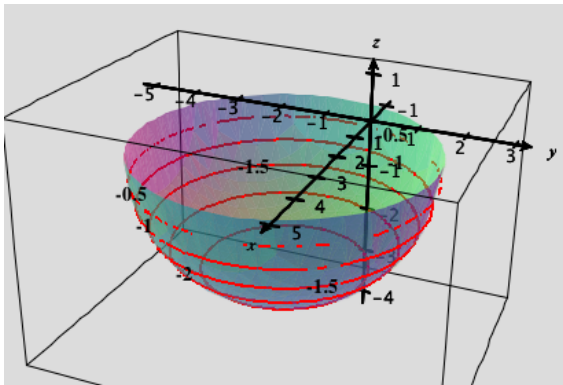
3. Let $\vec{v} = \langle 2, -1 \rangle$ and $\vec{w} = \langle 4, 3 \rangle$.

(a) [2] (WebHW7 #12) Draw and then find the components of $2\vec{w} - \vec{v}$.

(b) [2] (§12.1 #8) Find $||2\vec{w} - \vec{v}||$ and explain what you found in terms a 7th grader would understand.

(c) [3] (WebHW7 #15) Find a vector parallel to $\vec{w}$ but with length 2.

4. [4] (WebHW8 #14) Find the are of the triangle with vertices P, Q, and R where $P(0, -2, 0)$, $Q(5, 1, -2)$, and $R(6, 4, 1)$.