# MA 261 Quiz 2
## January 21, 2018

If you do not know how to do any one of these problems, circle **"(E) I don't know"** as your answer choice. You will receive **two points** for doing that. **Each problem** is worth **five points**. You get **two points** for writing your **full name** and **three points** for writing your **section number**.

**Problem 2.1.** At what points does the curve $\mathbf{r}(t) = \langle t, 0, 2t - t^2 \rangle$ intersect the paraboloid $z = x^2 + y^2$?

(A) $(0, 0, 0), (1, 0, 1)$
(B) $(2, 0, 4), (2, 0, 0)$
(C) $(-1, 0, -3), (1, 1, 2)$
(D) $\left(1, \frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right), (0, 1, 1)$
(E) I don't know how to do this

**Problem 2.2.** What does the equation

$$x^2 - 2y^2 + z^2 = -1$$

represent as a surface in $\mathbf{R}^3$?

(A) elliptic paraboloid
(B) hyperboloid of one sheet
(C) hyperboloid of two sheets
(D) hyperbolic paraboloid
(E) I don't know how to do this

**Problem 2.3.** Two particles travel along the curves

$$\mathbf{r}_1(t) = \langle t, t^2 + 1, -t \rangle, \text{ and } \mathbf{r}_2(t) = \langle 1 + 2t, 3 + t, 4 + 3t \rangle.$$

What is their first point of collision?

(A) $(-1, 2, 1)$
(B) $(1, 2, -1)$
(C) $(1, 3, 4)$
(D) the particles do not collide
(E) I don't know how to do this