# Written Homework 2

1. Let $P = (1, 0, -3)$, $Q = (0, -2, -4)$, and $R = (4, 1, 6)$ be points in $\mathbb{R}^3$. Find the area of the triangle formed by P, Q, and W.

2. In a gesture of goodwill (or perhaps just wanting to move a test along), GLaDOS offers Chel a Companion Cube, a cubical box that falls out of a hatch in the ceiling. At one point in the cube's descent, three of the vertices of the box are $(3, 1, 2)$, $(1, -1, 3)$, and $(2, -3, 1)$, as shown below. (*Note:* even though the box itself isn't a perfect cube, it's vertices do form a cube.)
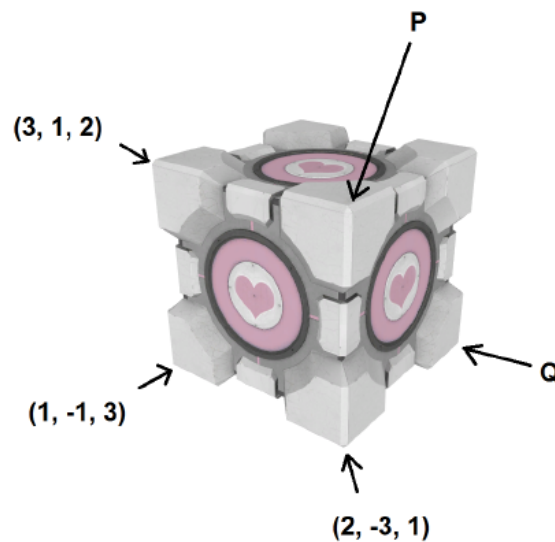
What are the coordinates of points P and Q, shown above? Show your work.

3. Find an equation of the largest sphere contained in the cube determined by the planes $x = 2$, $x = 6$, $y = 5$, $y = 9$, $z = -1$, $z = 3$.