Review Practice: Chapter 12

1. Sketch the following:

   (a) $y = z^2$

   (b) $x^2 = y^2 + 4z^2$

   (c) $-4x^2 + y^2 - 4z^2 = 4$

2. Find parametric equations for the line through $(4, -1, 2)$ and $(1, 1, 5)$.

3. Find the equation of the plane through $(2, -1, -1)$ parallel to the plane $x + 4y - 3z = 1$.

4. A boart is pulled onto shore using 2 ropes, one at an angle of 20° and the other at an angle of 30° from the front center of the boat. If a force of 255N is needed, find the magnitude of the force in each rope.

5. State whether the result is a vector or scalar if defined, otherwise state not defined:

   (a) $(\mathbf{a} \times \mathbf{b}) \cdot (\mathbf{c} \times \mathbf{d})$

   (b) $(\mathbf{a} \cdot \mathbf{b}) \times (\mathbf{c} \cdot \mathbf{d})$

   (c) $(\mathbf{a} \times \mathbf{b}) \times (\mathbf{c} \times \mathbf{d})$

6. Find x so that $\langle 3x, 0, 1+x \rangle$ and $\langle 1+x, 1-x, 1 \rangle$ are orthogonal. Is there any x so that they are parallel?