

## Math 2260 HW #14

Due 10:10 AM Friday, April 20

**Reading:** Hass §11.1–11.3

**Problems:** Do the assignment “HW14” on WebWork. In addition, write up solutions to the following problems and hand in your solutions in class on Friday.

1. (a) Describe geometrically the set of points  $(x, y, z)$  satisfying the inequalities

$$1 \leq x^2 + y^2 + z^2 \leq 4.$$

- (b) Describe geometrically the set of points  $(x, y, z)$  satisfying the inequalities

$$x^2 + y^2 + z^2 \leq 1 \quad \text{and} \quad z \geq 0.$$

You can describe these sets purely in terms of words, but it may be helpful to draw a picture.

2. Let  $\vec{\mathbf{u}} = 2\vec{\mathbf{i}} + 3\vec{\mathbf{j}}$ ,  $\vec{\mathbf{v}} = 8\vec{\mathbf{i}} - 13\vec{\mathbf{j}}$ , and  $\vec{\mathbf{w}} = -\vec{\mathbf{i}} + \vec{\mathbf{j}}$ . Find real numbers  $a$  and  $b$  so that

$$\vec{\mathbf{u}} = a\vec{\mathbf{v}} + b\vec{\mathbf{w}}.$$