Kaleb Burris
University of Alaska Fairbanks
MATH F253, Elizabeth S. Allman, Homework 3

2.5: 268, 271, 274, 280, 286, 288, 299

268.

a.

$$\text{Given: } P(3,2,2), \quad \vec{n} = \langle 2,3,-1 \rangle$$
$$\boxed{2(x-3)+3(y-2)-(z-2)=0}$$

b.

$$\boxed{2x+3y-z-10=0}$$

271.

a.

$$\vec{n} = \langle 4,5,10 \rangle = \boxed{4\hat{\mathbf{i}}+5\hat{\mathbf{i}}+10\hat{\mathbf{k}}}$$

b.

$$x\text{-axis: } 4x-20=0 \rightarrow \boxed{x=5}$$
$$y\text{-axis: } 5y-20=0 \rightarrow \boxed{y=4}$$
$$z\text{-axis: } 10z-20=0 \rightarrow \boxed{z=2}$$

274.

a.

$$\vec{n} = \langle 1,0,1 \rangle = \boxed{1\hat{\mathbf{i}}+1\hat{\mathbf{k}}}$$

b.

$$x\text{-axis: } \boxed{x=0}$$
$$y\text{-axis: } \boxed{y=\mathbb{R}}$$
$$z\text{-axis: } \boxed{z=0}$$

280.

$$\vec{t} = \langle 1,-1,1 \rangle, \vec{n} = \langle \alpha,5,1 \rangle: \quad \text{Find } \alpha \text{ such that } \vec{t} \cdot \vec{n} = 0$$
$$\vec{t} \cdot \vec{n} = \alpha - 5 + 1 \rightarrow \boxed{\alpha = 4}$$

286.

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3.1: 2, 3, 6, 9, 13, 14, 16, 23, 29, 37

3.2: 43, 47, 53, 54, 63, 64, 67, 68, 70, 71, 72, 77, 81, 86, 95, 96, 101