173 Final Exam Review #1-8

1. $39/\sqrt{33}$

2. 115N, 58N

3. $d = \sqrt{14}$, $\theta = \cos^{-1}\frac{1}{\sqrt{14}}$

4. method 1 direction vectors

$v_1 = \langle -3, 1, -2 \rangle$

$v_2 = \langle 6, -2, 4 \rangle$

$\vec{v}_2 = c \cdot \vec{v}_1$ (scalar)

Method 2

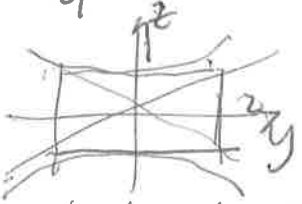
$v_1 \times v_2 = 0$

$\therefore$ v_1 and v_2 parallel

b) $3x + y - 4z + 11 = 0$

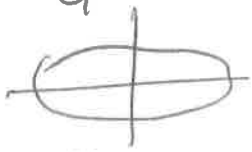
5. a) $x = 0$

$-\frac{y^2}{4} + z^2 = 1$



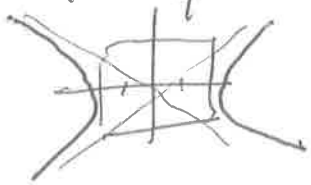
$y = 0$

$\frac{x^2}{4} + z^2 = 0$

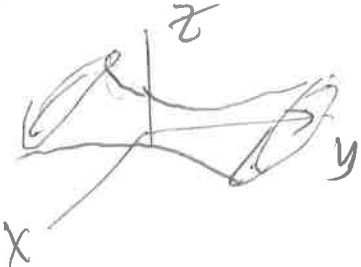


$z = 0$

$\frac{x^2}{4} - \frac{y^2}{4} = 1$



hyperboloid, one sheet, along y-axis



6. a) $(5\sqrt{2}, 30°, 5\sqrt{2}/2)$

b) $(5\sqrt{6}/4, 5\sqrt{2}/4, 5\sqrt{2}/2)$

7a) domain: $(0, \infty)$

b) $x = t$

$y = 1 + 3t$

$z = -1$

8. a) $(2, 3, 7)$

b) no solution

plane and line are parallel

Either

① Fixed r; z in terms of r OR

② Fixed z; r in terms of z

c) cylindrical: (r, θ, z)

① $3 \le z \le \sqrt{25 - r^2}$

$0 \le r \le 4$

$0 \le \theta \le 2\pi$

OR ②

$3 \le z \le 5$

$0 \le r \le \sqrt{25 - z^2}$

$0 \le \theta \le 2\pi$

spherical: not on test!

(but shown in class)