

Math 43 Midterm 3 Review Answers Only

[1] [a] $\langle \frac{2}{\sqrt{5}}, -\frac{1}{\sqrt{5}} \rangle$ or $\langle -\frac{2}{\sqrt{5}}, \frac{1}{\sqrt{5}} \rangle$
 [b] ≈ 4.25 radians
 [c] $-6\vec{i} + (4 + 8\sqrt{3})\vec{j}$

[2] [a] ≈ 2.94 radians
 [b] $\langle -\frac{1}{\sqrt{14}}, \frac{3}{\sqrt{14}}, \frac{2}{\sqrt{14}} \rangle$ or $\langle \frac{1}{\sqrt{14}}, -\frac{3}{\sqrt{14}}, -\frac{2}{\sqrt{14}} \rangle$
 [c] $\langle \frac{9}{13}, \frac{27}{13}, -\frac{36}{13} \rangle + \langle -\frac{9}{13}, -\frac{1}{13}, -\frac{3}{13} \rangle$
 [d] $(-6, 7, -12)$
 [e] $a = \frac{5}{4}, b = \frac{15}{4}$
 [f] -9

[3] [a] octant 6
 [b] $(-9, 4, 1)$
 [c] $\langle 6, -2, 1 \rangle$
 [d] $2\vec{i} + 6\vec{j} - 5\vec{k}$
 [e] $\sqrt{65}$
 [f] $\langle -\frac{2}{\sqrt{65}}, -\frac{6}{\sqrt{65}}, \frac{5}{\sqrt{65}} \rangle$
 [g] $\langle \frac{36}{\sqrt{41}}, -\frac{12}{\sqrt{41}}, \frac{6}{\sqrt{41}} \rangle$
 [h] ≈ -7.99
 [i] ≈ 17.47
 [j] $2\sqrt{165}$
 [k] ≈ 1.47 radians
 [l] -52
 [m] $x + 8y + 10z - 9 = 0$
 [n] $x = -5 + 6t, y = -2 - 2t, z = 3 + t$ **OTHER SOLUTIONS POSSIBLE**
 [o] $\frac{x-3}{2} = \frac{y-2}{3} = -z-1$ **OTHER SOLUTIONS POSSIBLE**
 [p] $(x+1)^2 + y^2 + (z-1)^2 = 24$

[4] 2, 3, 5, 8

[5] [a] center = $(2, -3, -5)$, radius = 3
 [b] no xy -trace
 xz -trace is point $(2, 0, -5)$
 yz -trace has equation $(y+3)^2 + (z+5)^2 = 5$ [circle in yz -plane, center = $(0, -3, -5)$, radius = $\sqrt{5}$]