Math 2043 **Test 1 Review – Even Answer Key** **Summer 2009**

Section 12.1

24. (a), (c), (d), and (f) are parallel to $\mathbf{v}$. (a) and (c) point in the same direction.

40. $\langle -2\sqrt{2}, -2\sqrt{2} \rangle$ **46.** $P = (4, 6)$

Section 12.2

10. $Q = (5, 5, 4)$ **27 Extra:** $x = 1 + 2t,\ y = 2 + t,\ z = -8 + 3t$

31 Extra: $x = 1 + 2t,\ y = 1 - 6t,\ z = 1 + t$

Section 12.3

60. $\theta = \cos^{-1}\left(\dfrac{58}{\sqrt{104}\sqrt{85}} \right)$

Section 12.4

34. $\mathbf{u}_1 = \left\langle -\dfrac{1}{\sqrt{66}}, -\dfrac{4}{\sqrt{66}}, \dfrac{7}{\sqrt{66}} \right\rangle, \quad \mathbf{u}_2 = \left\langle \dfrac{1}{\sqrt{66}}, \dfrac{4}{\sqrt{66}}, -\dfrac{7}{\sqrt{66}} \right\rangle$ **40.** 72

Section 12.5

26. $4x - 8y + 4z = 0$ or $x - 2y + z = 0$

Section 13.2

4. $\langle 1, 1, 0 \rangle$ **34.** $\left\langle -2t, \dfrac{\sqrt{2}}{2} - \dfrac{3\sqrt{2}}{2}t, -4t \right\rangle$ **42.** $\left\langle \dfrac{1}{2}\left(1 - e^{-1}\right), -\dfrac{1}{2} + \ln 2 \right\rangle$

Section 13.3

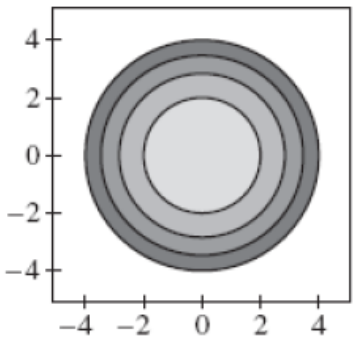
4. $\dfrac{1}{27}\left(176^{3/2} - 32^{3/2}\right)$ **19 (Extra):** $\sqrt{3}$

Section 13.5

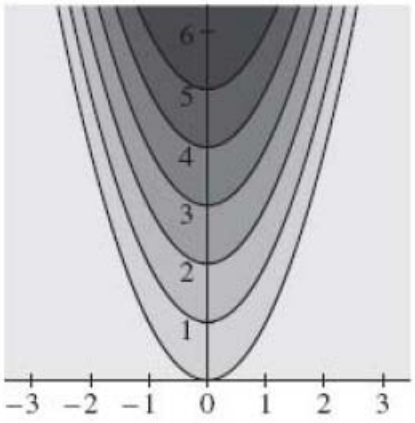
18. $\mathbf{v}(t) = \mathbf{i} - \mathbf{j} + \sin t\,\mathbf{k} \quad \mathbf{r}(t) = (t + 1)\mathbf{i} - t\mathbf{j} + (1 - \cos t)\mathbf{k}$

Section 14.1

4. $Q\left(2, \dfrac{\pi}{2}\right) = 6, \quad Q\left(-2, \dfrac{\pi}{2}\right) = 3$ **32.**



40.



44. A is the contour map of f and B is of g.

Section 14.2

34. As $(x.y)\to(0,0)$ along the line $y=0$, $\lim\limits_{(x,y)\to(0,0)} \dfrac{y^2}{x^2+y^2}=0$. As $(x.y)\to(0,0)$ along the line $y=x$, $\lim\limits_{(x,y)\to(0,0)} \dfrac{y^2}{x^2+y^2}=\dfrac{1}{2}$. Hence, the limit does not exist.

Section 14.3

2. $4x^2y^3+5y^4+x$

4. $\dfrac{2u+v}{u^2+uv}$

14. $\dfrac{\partial z}{\partial x}=4x^3y+y^{-2}$; $\dfrac{\partial z}{\partial y}=x^4-2xy^{-3}$

28. $\dfrac{\partial R}{\partial v}=-\dfrac{2v}{k}e^{-v^2/k}$; $\dfrac{\partial R}{\partial k}=\dfrac{v^2}{k^2}e^{-v^2/k}$

40. -6952

42. $\ln 3+\dfrac{1}{3}$

68. $R_{uvw}=\dfrac{2}{(v+w)^3}$;