

**Calculus 3 Final Examination Sample 5 - ANSWERS**  
*courtesy of Dr. Inna Sysoeva, University of Pittsburgh, adapted*

**Problem 1.**  $(\frac{3}{2}, \frac{3\sqrt{3}}{2}, 3)$

**Problem 2.** There are 6 possible correct answers. One of the possible answers is:

$$\int_0^1 \int_0^{(2-2x)} \int_0^{(1-\frac{y}{2}-\frac{z}{3})} dz \, dy \, dx$$

**Problem 3.** There are infinitely many possible answers. An example of the correct answer:  $x - z = 0$ .

**Problem 4.**  $\frac{2}{3}$

**Problem 5.** a)  $\sqrt{2}\pi$ ; b)  $\frac{\pi^2}{\sqrt{2}}$

**Problem 6.** a)  $\frac{4\pi\sqrt{2}}{3} - \frac{7\pi}{6}$  ; b) 0.

**Problem 7.** a)  $< 0, 0, 2 >$  and 0; The answer for b),c), d):  $\frac{4\pi}{3}$

**Problem 8.** There are many possible correct answers here. A possible choice:  $\mathbf{v} = < 1, -1, 0 >$  and  $\mathbf{w} = < 1, 1, -2 >$

**Problem 9.**  $-2$

**Problem 10.** 0