

# Math 2215 - Calculus 1

Exam #5 - 2017.12.04

Name: \_\_\_\_\_

---

**Instructions:** Please work out each problem in full detail. No points are given for a correct answer.

1. Let  $P(x) = -\frac{1}{4}(x+2)(x-3)$ , and  $S(x) = \sqrt{x-1}$ . Find the area of the region bounded by  $P(x)$ ,  $S(x)$ , and the  $x$ -axis which contains the point  $(0, 1)$ . *Hint: Evaluate  $P(2)$  and  $S(2)$ .*

2. Consider the finite region  $\mathcal{R}$  bounded by the  $y = -2x$ ,  $y = x + 6$  and the  $y$ -axis which contains the point  $(-1, 3)$ . Express the volume of the region  $\mathcal{R}$  about the following lines using **BOTH**  $dx$  and  $dy$  integrals. *You do not have to evaluate these integrals.*

(a)  $x = -3$ ,      (b)  $x = 1$ ,      (c)  $y = 6$ ,      (d)  $y = -1$

3. Compute the arc length of  $f(x) = \frac{2}{3}(x-1)^{3/2}$  for  $x \in [1, 25]$ .