Math 141 Quiz 2 — Practice version, October 2015

Name: _____ **ID#:** _____

- You have 40 minutes.

- Complete the following three problems. In order to receive full credit, please show all of your work and justify your answers.

- You do **not** need to simplify your arithmetic unless explicitly instructed to do so in the question. However, **a final answer involving a composition of a trigonometric function and an inverse-trigonometric function (in any order) will not be accepted**.

- If you need extra room for your answers, use the back side of the question pages, and clearly indicate that your answer continues there. Do not use your own scratch paper, and do not detach pages from this booklet.

- The use of cellphones, calculators, and other electronic devices, for whatever reason, is considered cheating.

Formulae you may find useful:

$$\sin^2(\theta) = \frac{1}{2}(1 - \cos(2\theta))$$
$$\cos^2(\theta) = \frac{1}{2}(1 + \cos(2\theta))$$
$$\sin(2\theta) = 2\sin\theta\cos\theta$$

The following boxes are strictly for grading purposes. Please do not mark.

Question:	1	2	3	**Total**
Points:	7	7	7	21
Score:				

1. (7 points) Let R be the region bounded by the curves

$$y = 3\cos 2x, \quad y = 6x + 3, \quad x = \frac{\pi}{6}.$$

Find the volume of the solid obtained by rotating R about the y-axis. **Simplify your answer as much as possible.**

2. (7 points) Compute the following integral:

$$\int \frac{2x^2 - 7}{(x - 1)(x^2 + 4)} dx.$$

3. (7 points) Compute the following integral:

$$\int x^2 \left(7 - x^2\right)^{-\frac{7}{2}} dx.$$