Math 2554 Exam 3: Sections 4.6-5.4 Fri 5 Dec 2014	Name:
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Please provide the following data:	
Drill Instructor:	
Drill Time:	
Student ID or clicker #:	
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1 '	Stata	\mathbf{p}_{α}	ا مادا	Theorem

2. Determine the point(s) that satisfy the conclusion of the Mean Value Theorem for the function $f(x) = x^3$ on the interval [-4, 5].

3. Evaluate $\lim_{n\to\infty} \left(1 + \frac{7}{n^2}\right)^{n^3}$.

4. Use geometry to evaluate

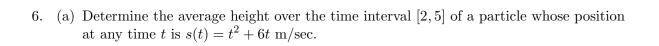
$$\int_0^5 |3-x| \, dx.$$

(Show your picture – it does not need to be to scale.)

- 5. Use the Fundamental Theorem of Calculus
 - (a) \dots Part I to find the derivative of

$$\int_{-3x}^5 \sqrt{2t+3}\,dt.$$

(b) ... Part II to find the area between the curve $f(x) = 4x^3 + 16x + 13$ and the x-axis over the interval [-1, 2].



(b) At what time t is the particle's height equal to its average height?

7. (a) Compute the midpoint Riemann sum for the function $f(x) = x^2 - 3x + 5$ on the interval [-1, 5] with n = 3.

(b) What is the **exact** area under the curve for $f(x) = x^2 - 3x + 5$ on the interval [-1, 5]?

EXTRA CREDIT Suppose you are standing on the shore of a circular pond with radius 1 mile and you want to get to a point on the shore directly opposite your position (on the other end of a diameter). You plan to swim at 2 miles per hour from your current position to another point P on the shore and then walk at 3 miles per hour along the shore to the terminal point. How should you choose P to minimize the total time for the trip?

(MathFact: For a circle of radius r and a chord on the circle with central angle θ , the length

(MathFact: For a circle of radius r and a chord on the circle with central angle θ , the length of the chord is given by $2r\sin\frac{\theta}{2}$. Given an arc with central angle ϕ , the arc length is $r\phi$.)