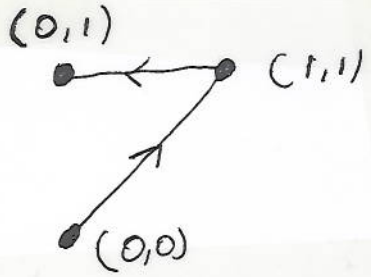
Recitation Time_____ PRINT your name _____

Math 141, Exam 1, Spring 2009

The exam is worth a total of 50 points. There are 7 questions on 3 pages. SHOW your work. Make your work be coherent and clear. Write in complete sentences whenever this is possible. $\boxed{CIRCLE}$ your answer. **CHECK** your answer whenever possible. **No Calculators.**

I will post the solutions on my website a few hours after the exam is finished.

1. (7 points) Parameterize the curve pictured below. Use t as your parameter with $0 \le t \le 2$. The point that corresponds to $t = 0$ is $(0, 0)$. The point that corresponds to $t = 1$ is $(1, 1)$. The point that corresponds to $t = 2$ is $(0, 1)$. (Note: Each part of the curve that **looks** like a line segment **is** a line segment.)



2. (7 points) Express $\sin(\theta + \varphi)$ in terms of $\sin\theta$, $\sin\varphi$, $\cos\theta$, and $\cos\varphi$.

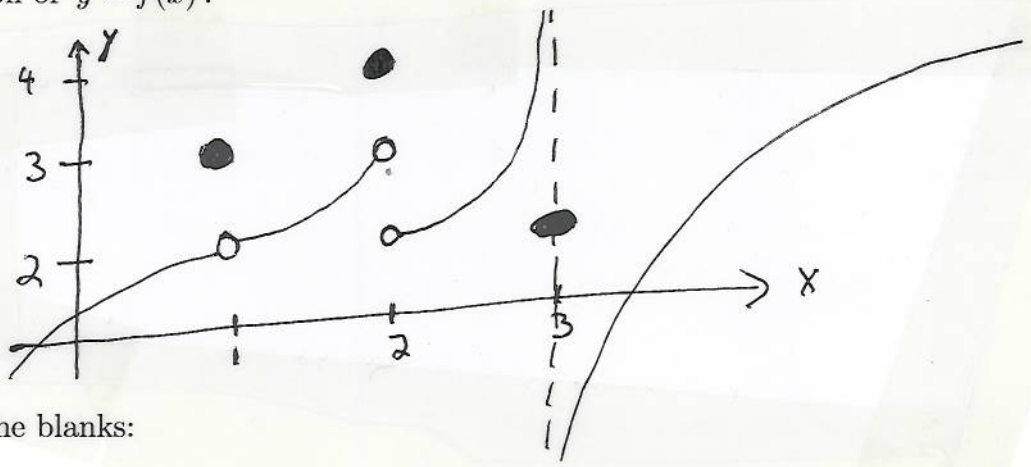
3. (7 points) Compute $\lim_{x \to 6^+} \frac{x+6}{x^2-36}$.

4. (7 points) Compute $\lim_{x \to 6^-} \frac{36-x}{6-\sqrt{x}}$.

5. (7 points) Let $f(x) = 2x^2+3$. Find $\frac{f(a)-f(b)}{a-b}$ and simplify as much as possible.

6. (7 points) Graph $y = 2\sin(3x)$. Identify a few points on the graph.

7. (8 points) (The penalty for each mistake is four points.) The picture represents the graph of $y = f(x)$.



Fill in the blanks:

$f(1) =$ ___ $\lim_{x\to 1^+} f(x) =$ ___ $\lim_{x\to 1^-} f(x) =$ ___ $\lim_{x\to 1} f(x) =$ ___

$f(2) =$ ___ $\lim_{x\to 2^+} f(x) =$ ___ $\lim_{x\to 2^-} f(x) =$ ___ $\lim_{x\to 2} f(x) =$ ___

$f(3) =$ ___ $\lim_{x\to 3^+} f(x) =$ ___ $\lim_{x\to 3^-} f(x) =$ ___ $\lim_{x\to 3} f(x) =$ ___