NAME: _____ (DUE 03/30/15)

The following rules apply:

1. All questions are worth either 1 point or no points at all. In other words, there is no partial credit so check your solutions carefully.

2. This assignment can replace your lowest un-dropped quiz score.

3. You can consult with ANY person or group of persons with the exception of me or any member of my immediate family.

4. The assignment must be done on *a separate sheet* in your own handwriting. No typed/PDF/emailed solutions.

5. **STAPLE** this coversheet to the front of your solutions. **Do not** write on it.

6. Note the due date above. The "due time" is as soon as you walk through the door.

7. I do not give solutions/corrections for the extra credit. So I suggest handing it in early so you will have time to make corrections and resubmit. If you resubmit, please include all previously graded versions so I can update your score.

Sketch the following curves. Include the extrema and inflection points, if any.

1. $f'(x)$ *and* $f''(x)$ *are always positive.*

2. $f'(x)$ *is always negative and* $f''(x)$ *is always positive.*

3. $f'(x)$ *and* $f''(x)$ *are always negative.*

4. $f'(x)$ *is always positive and* $f''(x)$ *is always negative.*

5. $f(0)=2, f(1)=0, f(2)=-2, f'(0)=0, f'(2)=0,$
$f'(x)>0$ *on* $(-\infty,0)\cup(2,\infty), f'(x)<0$ *on* $(0,2)$
$f''(1)=0,\ f''(x)>0$ *on* $(1,\infty), f''(x)<0$ *on* $(-\infty,1)$

6. $f(-2)=-2, f(0)=1, f(2)=4, f'(-2)=0, f'(2)=0,$
$f'(x)>0$ *on* $(-2,2), f'(x)<0$ *on* $(-\infty,-2)\cup(2,\infty)$
$f''(0)=0,\ f''(x)>0$ *on* $(-\infty,0), f''(x)<0$ *on* $(0,\infty)$

7. $f(2)=3, f(4)=5, f(6)=7, f'(2)=0, f'(6)=0,$
$f''(x)>0$ *on* $(-\infty,4), f''(x)<0$ *on* $(4,\infty), f''(4)=0$

8. $f(0)=1, f(2)=-3, f(1)=-1, f'(0)=0, f'(2)=0,$
$f'(x)>0$ *on* $(-\infty,0)\cup(2,\infty), f'(x)<0$ *on* $(0,2)$
$f''(1)=0,\ f''(x)>0$ *on* $(1,\infty), f''(x)<0$ *on* $(-\infty,1)$

9. $f'(0)=f'(2)=f'(4)=0,$
$f'(x)>0$ *on* $(-\infty,0)\cup(2,4), f'(x)<0$ *on* $(0,2)\cup(4,\infty)$
$f''(x)>0$ *on* $(1,3), f''(x)<0$ *on* $(-\infty,1)\cup(3,\infty)$

10. $f(0)=-2, f(1)=0, f(2)=4,$
$f'(0)=0, f'(2)=0, f'(1)=$ *undefined*
$f'(x)>0$ *on* $(0,1)\cup(1,2), f'(x)<0$ *on* $(-\infty,0)\cup(2,\infty)$
$f''(1)=$ *undefined*, $f''(x)>0$ *on* $(-\infty,1), f''(x)<0$ *on* $(1,\infty)$