Answers to Review for 2nd Six Weeks Exam

1. $f'(x)=3x^2+6x-9$ $f''(x)=6x+6$
   a. Inc: $(-\infty,-3),(1,\infty)$ Dec: $(-3,1)$
   b. Max: $(-3,33)$ Min: $(1,1)$
   c. CCD: $(-\infty,-1)$ CCU: $(-1,\infty)$ Infl. Pt: $(-1,17)$
2. $f'(x)=-x^3+12x+5$ $f''(x)=-6x$
   a. Inc: $(-2,2)$ Dec: $(-\infty,-2),(2,\infty)$
   b. Max: $(2,21)$ Min: $(-2,-11)$
   c. CCD: $(0,\infty)$ CCU: $(-\infty,0)$ Infl. Pt: $(0,5)$
3. $f'(x)=1-\sin x$ $f''(x)=-\cos x$
   a. Always increasing
   b. No local max or min
   c. CCD: $\left(-2\pi,-\frac{3\pi}{2}\right),\left(-\frac{\pi}{2},\frac{\pi}{2}\right),\left(\frac{3\pi}{2},2\pi\right)$ CCU: $\left(-\frac{3\pi}{2},-\frac{\pi}{2}\right),\left(\frac{\pi}{2},\frac{3\pi}{2}\right)$
   Infl. Pts: $\left(-\frac{3\pi}{2},-\frac{3\pi}{2}\right),\left(-\frac{\pi}{2},-\frac{\pi}{2}\right),\left(\frac{\pi}{2},\frac{\pi}{2}\right),\left(\frac{3\pi}{2},\frac{3\pi}{2}\right)$
4. $f'(x)=2\cos x-\cos 2x$ $f''(x)=-2\cos x+4\cos 2x$
   a. Inc: $\left(0,\frac{\pi}{3}\right),\left(\pi,\frac{5\pi}{3}\right)$ Dec: $\left(\frac{\pi}{3},\pi\right),\left(\frac{5\pi}{3},2\pi\right)$
   b. Max: $\left(\frac{\pi}{3},2\right),\left(\frac{5\pi}{3},2\right)$ Min: $(\pi,-3)$

   You may omit this problem…Inflection points were NASTY!!
5. $f'(x)=-6x^2-6x$ $f''(x)=-12x-6$
   a. Inc: $(-1,0)$ Dec: $(-\infty,-1),(0,\infty)$
   b. Max: $(0,-6)$ Min: $(-1,-7)$
   c. CCD: $\left(-\frac{1}{2},\infty\right)$ CCU: $\left(-\infty,-\frac{1}{2}\right)$ Infl. Pt: $\left(-\frac{1}{2},-\frac{13}{2}\right)$
6. $f'(x)=\frac{-4x}{(x-2)^3}$ $f''(x)=\frac{8x+8}{(x-2)^4}$
   a. VA: x=2 HA: y=1
   b. Always increasing
   c. No max Min: $(0,0)$

d. CCD: $(-\infty,-1)$ CCU: $(-1,2),(2,\infty)$ Infl. Pts: $\left(-1,\frac{1}{9}\right)$

7. Max: $(1,2)$
8. Min: $(0,1)$
9. 1
10. X=0
11. Max: $(4,16)$ Min: $(2,-16)$
12. Max: $(\pi,\pi+2)$ Min: $\left(-\frac{\pi}{6},-\frac{\pi}{6}-\sqrt{3}\right)$
13. No critical Points Max: $\left(0,-\frac{1}{2}\right)$ Min: $(1,-1)$
14. 2.0945
15. 3.1748