Homework for Packet #15

1. Concave up: $(-\infty,-1) \cup \left(\frac{1}{2},\infty\right)$; Concave down: $\left(-1,\frac{1}{2}\right)$; Inflection points: $(-1,-2)$, $\left(\frac{1}{2},\frac{7}{16}\right)$
2. Concave up: $(-2,2)$; Concave down: $(-\infty,-2) \cup (2,\infty)$; Inflection points: None
3. Concave up: $\left(-\infty,-2-\sqrt{2}\right) \cup \left(-2+\sqrt{2},\infty\right)$; Concave down: $\left(-2-\sqrt{2},-2+\sqrt{2}\right)$; Inflection points: $(-3.41, 0.38)$, $(-0.59, 0.19)$
4. Concave up: $\left(-\sqrt{3},\sqrt{3}\right)$; Concave down: $\left(-\infty,-\sqrt{3}\right) \cup \left(\sqrt{3},\infty\right)$; Inflection points: $\left(-\sqrt{3},\sqrt[3]{4}\right)$, $\left(\sqrt{3},\sqrt[3]{4}\right)$
5. Concave up: $\left(e^{3/2},\infty\right)$; Concave down: $\left(0,e^{3/2}\right)$; Inflection point: $\left(e^{3/2},\frac{3}{2e^{3/2}}\right)$
6. Concave up: $\left(\frac{\pi}{4},\frac{5\pi}{4}\right)$; Concave down: $\left[0,\frac{\pi}{4}\right) \cup \left(\frac{5\pi}{4},2\pi\right]$; Inflection points: $\left(\frac{\pi}{4},0\right)$, $\left(\frac{5\pi}{4},0\right)$
7. Concave up: $(-\infty,0) \cup (1,\infty)$; Concave down: $(0,1)$; Inflection points: $(0,0)$, $(1,9)$
8. Local max at $(-2,13)$, Local min at $(1,-14)$
9. Local max at $(-1,-3)$, Local min at $(1,5)$
10. Local min at $\left(\frac{1}{\sqrt[3]{e}},-\frac{1}{3e}\right)$