

Fall 2005 Math 151
Solutions to Week in Review 9

1. $c = \frac{1}{2}$
2. $4 \leq f(4) \leq 16$
3. a.) Inc: $(-2, 0)$ and $(1, \infty)$; Dec: $(-\infty, -2)$ and $(0, 1)$. Local max: $(0, 8)$; Local mins: $(-2, -24)$ and $(1, 3)$
b.) Inc: $(0, \infty)$; Dec: $(-\infty, 0)$; Local min: $(0, 0)$; Local max: none.
c.) Inc: $(-1, 1)$; Dec: $(-\infty, -1)$ and $(1, \infty)$. Local min: $(-1, -\frac{1}{4})$, Local max: none.
d.) Inc: $(-\pi, -\frac{\pi}{2})$, $(0, \frac{\pi}{2})$, Dec: $(-\frac{\pi}{2}, 0)$ and $(\frac{\pi}{2}, \pi)$. Local min: $(0, 1)$; Local max: $(-\frac{\pi}{2}, \frac{\pi}{2})$ and $(\frac{\pi}{2}, \frac{\pi}{2})$
4. Concave up: $(-3, \infty)$; Concave down: $(-\infty, -3)$; Inflection point $(-3, 162)$
5. $f(x)$ increasing on $(0, \infty)$; decreasing on $(-\infty, 0)$. Concave up: $(-\frac{1}{2}, \infty)$; Concave down: $(-\infty, -\frac{1}{2})$
6. Local min at $(-3, 4)$; Local max at $(2, -5)$
7. $18 \times 18 \times 36$ cubic inches
8. $(1.2, -6)$
9. The area is maximized if the entire wire is used to make a circle; the area is minimized if $\frac{12\pi\sqrt{3}}{9 + \sqrt{3}\pi}$ inches is used to make the circle,
and $12 - \frac{12\pi\sqrt{3}}{9 + \sqrt{3}\pi}$ is used to make the triangle.
10. 4×8