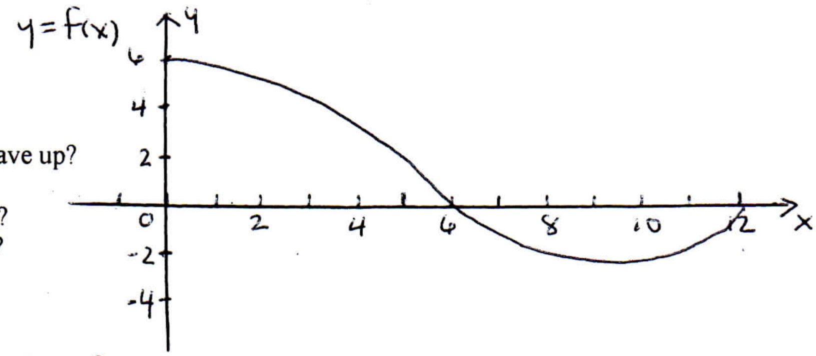
CALCULUS: Homework
2/5 – 2/9

due: Tuesday:
pp. 392-393 / #25, 43, 44, 45, 46, 52, 53

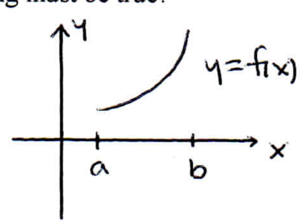
Wednesday:
Let $H(x) = \int_0^x f(t)dt$, where f is the continuous function with domain [0,12] graphed below.



1. Find $H(0)$.
2. On what interval(s) is H increasing?
3. On what interval(s) is the graph of H concave up?
4. Is $H(12)$ positive or negative?
5. Where does H achieve its maximum value?
6. Where does H achieve its minimum value?

Thursday: read pp. 373 – 374
1. pg. 379 / #19, 21
2. Let $f(x)$ be the function defined by $f(x) = \begin{cases} x^2, & x \le 0 \\ x^2 + x, & x > 0 \end{cases}$, find $\int_{-2}^{1} f(x)dx$.
3. If $\int_a^b f(x)dx = 5$ and $\int_a^b g(x)dx = -1$, which of the following must be true?
   a. $\int_a^b [f(x) + g(x)]dx = 4$
   b. $\int_a^b [f(x) \cdot g(x)]dx = -5$
   c. $\int_a^b 2f(x)dx = 10$
   d. $f(x) > g(x)$ for $a \le x \le b$
4. If $\int_2^8 f(x)dx = -10$ and $\int_2^4 f(x)dx = 6$, find $\int_8^4 f(x)dx$.
5. Let $f(x)$ be a continuous function on [1,4]. If $5 \le f(x) \le 9$, find the least possible and greatest possible values of $\int_1^4 f(x)dx$.

Friday: read pp. 374 – 375
1. pg. 379 / #23, 24, 25
2. If f is a continuous and increasing function on $[a, b]$ as shown, which of the following must be true?
   a. $\int_a^b f(x)dx < f(b)(b-a)$
   b. $\int_a^b f(x)dx > f(a)(b-a)$
   c. $\int_a^b f(x)dx = f(c)(b-a)$ for $a < c < b$



Monday:
1. Find the area of the region bounded by the given curves:
   a. $y = 4 - x^2$, the x-axis (the x-intercepts are the limits)
   b. $y = \sqrt{x+1}$, the x-axis, the y-axis, $x = 8$
2. Evaluate: a. $\int_{-4}^{2} |x+2|dx$ b. $\int_{-1}^{7} |x-3|dx$
3. Evaluate: a. $D_x \int_x^5 (t^3 - 7t + 3)dt$ b. $\frac{d}{dx}\int_1^{2x+3} \frac{dt}{3t+1}$