

MATH 112 SOLUTIONS FOR 5.2, P. 366

1. Between 123 and 194 feet
4. (a) Between $\frac{41}{4}$ mile and $\frac{31}{4}$ mile. (b) $\frac{10}{4}$ mile. (c) Every 6 minutes.
5. (a) The water level is decreasing. (b) The water level is rising between early February and late June. Water level is higher on July 1, because the inflow area is greater than the outflow area. (d) The water level is lower at the end of the year, because total outflow area is greater than inflow area.
8. (a) 12 or 13; 25. (b) 200; 500. (c) 600. (d) 50. (e) decreasing; increasing. (f) Yes, about 4:35. (g) 1 pm; 75; 1 hour.
10. (a) $2 + 4 + 6 = 12$. (d) $e^3 + e^6 + \cdots + e^{3n}$. (e) $\frac{6}{26} + \frac{7}{37} + \frac{8}{50} + \frac{9}{65} + \frac{10}{82}$.
11. (c) $\sum_{k=1}^{25} \frac{1}{k}$. (d) $\sum_{k=1}^{30} 3k$.
12. (c) We get 1 for m and for each of the $n - m$ numbers from $m + 1$ to n .
 (f)
$$\frac{LHS(n) + RHS(N)}{2} = \frac{[f(x_0) + \cdots + f(x_{n-1})]\Delta x + [f(x_1) + \cdots + f(x_n)]\Delta x}{2}$$

$$= \frac{[f(x_0) + 2f(x_1) + \cdots + 2f(x_{n-1}) + f(x_n)]\frac{\Delta x}{2}}{2} = [f(x_0) + 2\sum_{k=1}^{n-1} f(x_k) + f(x_n)]\frac{\Delta x}{2}.$$
14. If $s = \frac{1}{2}gt^2$, then $v = gt$ and the time lapsed is $\Delta t = b - a$, so that the distance traveled is $s(b) - s(a) = \frac{1}{2}gb^2 - \frac{1}{2}ga^2 = \frac{1}{2}(ga + gb)(b - a) = \frac{1}{2}[v(a) + v(b)]\Delta t$.