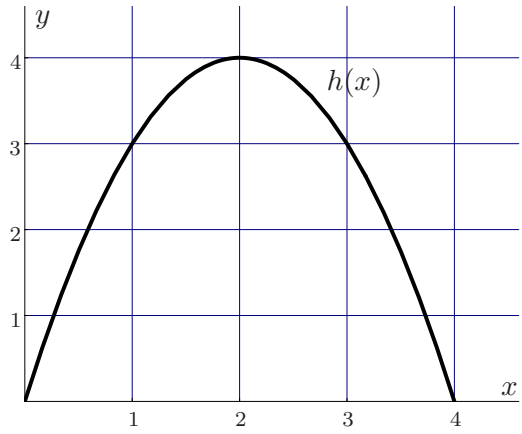
3. (9 points) Problems (a) and (b) below are independent of each other.

(a) (6 pts.) The graph of a function $h(x)$ is given below.



• Numbers:

$A = h'(1)$, $B = h'(2)$, $C = h'(3)$, $D = h'(3.001)$, $E = \dfrac{h(3)}{3}$, $F = \dfrac{h(3) - h(2)}{3 - 2}$.

• Write the the numbers A–F from smallest to largest:

$D\ (\simeq -2.2),\ C\ (\simeq -2),\ F\ (\simeq -1),\ B\ (\simeq 0),\ E\ (\simeq 1),\ A\ (\simeq 2)$

(smallest) (largest)

(b) (3 pts.) Consider the function $w(x)$ given by:

$$w(x) = \begin{cases} -x + 3, & 0 \le x < 1 \\ 2x, & 1 \le x \le 2 \end{cases}$$

Write the numbers L, I, R (defined below) from smallest to largest.

• Numbers:

L = Left-hand sum of w over [0,2] using 2 subdivisions

$I = \displaystyle\int_0^2 w(x)\ dx$

R = Right-hand sum of w over [0,2] using 2 subdivisions.

• Ordered numbers:

$L\ (= 5),\ I\ (= 5.5),\ R\ (= 6)$

(smallest) (largest)