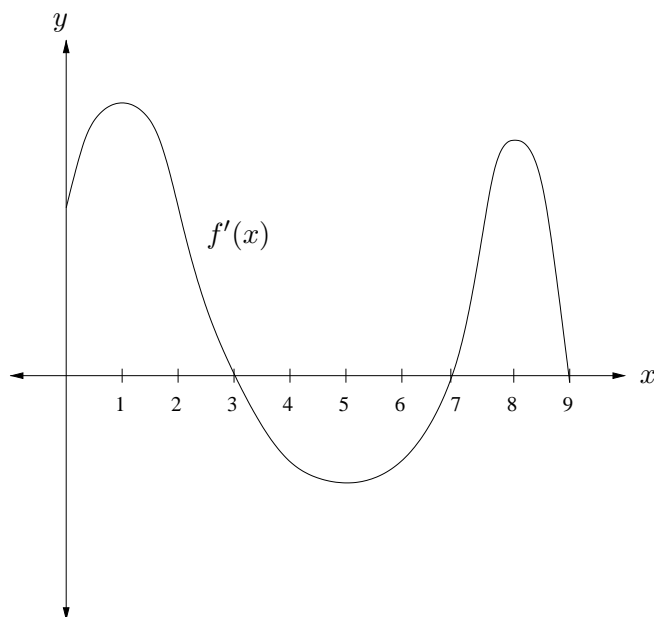


9. (10 points) The graph of $f'(x)$ (i.e., the *derivative* of f) is given below. Use the graph to answer the following questions:



(a) For which intervals is f increasing?

f is increasing when its derivative is positive, so for $0 < x < 3$ and $7 < x < 9$.

(b) For which intervals is f'' negative?

f'' is negative when f' is decreasing, so for $1 < x < 5$ and $8 < x < 9$.

(c) For which value(s) of x (if any) does f have a local maximum?

[Note: This was excluded from grading.] f has a local maximum at a value a when f' is positive for $x < a$ and negative for $x > a$. So f has a local maximum when $x = 3$.

(d) For which value(s) of x (if any) does f switch from concave up to concave down?

f will switch from concave up to concave down when the second derivative switches from being positive to being negative, i.e., when the derivative switches from increasing to decreasing, so at $x = 1$ and $x = 8$.