10. (10 points) The figure below gives the graph of the derivative $f'$ of a function $f$.

(a) On what interval(s) is $f$ increasing?

$\frac{df}{dx}$ is increasing for $x < 3$. 

(b) On what interval(s) is $f$ concave down?

The function is concave down when $f''$ is decreasing, i.e., for $x < -2.5$ and for $1 < x < 5$.

(c) For what value of $x$ (approximately) is $f(x)$ the largest? Explain.

The function is increasing until $x = 3$, then decreases. Thus, $f$ has its largest value at $x = 3$.

(d) For what value of $x$ (approximately) is $f''(x)$ the largest? Explain.

The second derivative, $f''$, would be largest when the slope of $f'$ (i.e., a tangent to $f$) is smallest in a positive direction. This appears to be around $x = -1$. (see graph)