1. For the function $f$ graphed below, determine where $f''(x)$ is positive and where it is negative. (Indicate your answers on the graph.)

![Graph of the second derivative](image.png)

**Solution:** $f''(x)$ is positive for $x$ between $-3$ and $-1$ and for $x > 2$. $f''(x)$ is negative for $x < -3$ and for $x$ between $-1$ and $2$.

2. Sketch the graph of a function $f$ with the properties that $f''(x) > 0$ and $f'(x) > 0$ for all $x$.

**Solution:**

![Graph of the function](image2.png)

I have graphed $e^x$.

3. Suppose that $f$ is a function such that $f(4) = 2$ and $f'(4) = 0.25$. Estimate $f(4.1)$.

**Solution:** The slope of the tangent line is 0.25, so for a run of 0.1, the rise (along the tangent line) will be 0.025. Since the rise begins at 2, the ending $y$-value is 2.025, and that is an estimate for $f(4.1)$.