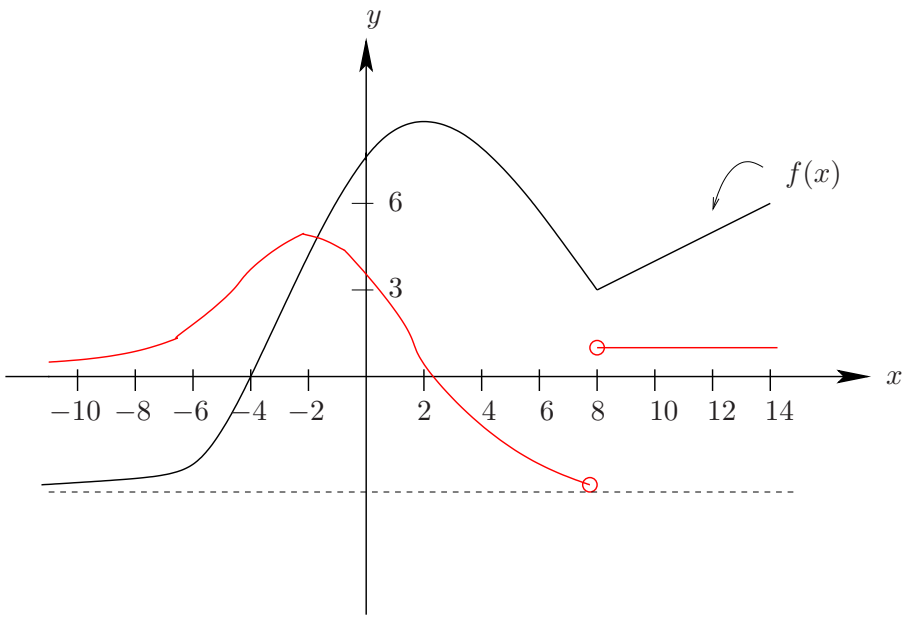
7. (12 points) The graph of a function f is given below.



(a) On the same set of axes, draw a graph of the derivative, $f'(x)$.

(b) Determine $f''(12)$.

$f''(12) = 0$

(c) Describe in words what the expression $\dfrac{f(-2) - f(4)}{-6}$ represents graphically.

The given quotient represents the slope of the line connecting the points $(-2, f(-2))$ and $(4, f(4))$.

(d) Write the following slopes in increasing order:

$$\frac{f(2)}{2} \qquad \frac{f(14) - f(8)}{14 - 8} \qquad \frac{f(4)}{4}$$

We may interpret each as the slope of a line. We get

$$\frac{f(14) - f(8)}{14 - 8} < \frac{f(4)}{4} < \frac{f(2)}{2}.$$