2. \(2 + 3 \cos \left( \frac{2\pi}{5} (x - \frac{5}{2}) \right)\) or \(2 + 3 \sin \left( \frac{2\pi}{5} (x - \frac{5}{2}) \right)\). There are other equivalent correct answers.

4. (a) Average velocity is
\[
\frac{s(3 + h) - s(3)}{(3 + h) - 3} = \frac{4(3 + h) - (3 + h)^2 - 4(3) + 3^2}{h} = \frac{4h - 6h - h^2}{h} = -2 - h.
\]

(b) Average velocity is
\[
\frac{s(3) - s(2.75)}{3 - 2.75} = \frac{4(3) - 3^2 - 4 \left( \frac{11}{4} \right) + \left( \frac{11}{4} \right)^2}{3 - \frac{11}{4}} = 4 \cdot \left( 1 - \frac{144}{16} + \frac{121}{16} \right) = \frac{7}{4}.
\]

(c) Since \(s'(t) = 4 - 2t\), we have \(s'(4) = 4 - 8 = -4\).

(d) We have \(s(3) = 4(3) - 3^2 = 3\) and \(s'(3) = -2\) (by part (a)). So the equation is
\[y - 3 = -2(x - 3)\.

5. Possible graph of \(f(x)\) (could be shifted up or down by a constant):
Possible graph of $f''(x)$:

$$7.(c)\ v'(x) = -\frac{3}{2} x^{-3/2} + 1.$$