## Quiz 4.6

Name

1. Let $f$ be a function such that at each point $(x, y)$ on the graph of $f$, the slope is given by $\frac{dy}{dx} = y^2 - x$. The graph of $f$ passes through the point $(1, 2)$ and is concave down on the interval $1 < x < 1.5$. Let $k$ be the approximation for $f(1.2)$ found by using the locally linear approximation of $f$ at $x = 1$. Which of the following statements about $k$ is true?

(A) $k = 5.6$ and is an overestimate for $f(1.2)$.

(B) $k = 5.6$ and is an underestimate for $f(1.2)$.

(C) $k = 2.6$ and is an overestimate for $f(1.2)$.

(D) $k = 2.6$ and is an underestimate for $f(1.2)$.

2.

| $x$ | 3.8 | 4.0 | 4.2 | 4.4 |
|---|---|---|---|---|
| $g'(x)$ | $-0.8$ | 2.2 | 1.8 | $-1.2$ |

Selected values of the derivative of the function $g$ are given in the table above. It is known that $g(4) = 12$. What is the approximation for $g(4.2)$ found using the line tangent to the graph of $g$ at $x = 4$ ?

(A) 12.44

(B) 12.40

(C) 12.36

(D) 11.60

3. Let $g$ be a differentiable function such that $g(3) = 2$ and $g'(3) = -\frac{3}{4}$. The graph of $g$ is concave down on the interval $(2, 4)$. Which of the following is true about the approximation for $g(2.6)$ found using the line tangent to the graph of $g$ at $x = 3$ ?

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(A) $g(2.6) \approx 1.7$ and this approximation is an overestimate of the value of $g(2.6)$.

(B) $g(2.6) \approx 1.7$ and this approximation is an underestimate of the value of $g(2.6)$.

(C) $g(2.6) \approx 2.3$ and this approximation is an overestimate of the value of $g(2.6)$.

(D) $g(2.6) \approx 2.3$ and this approximation is an underestimate of the value of $g(2.6)$.