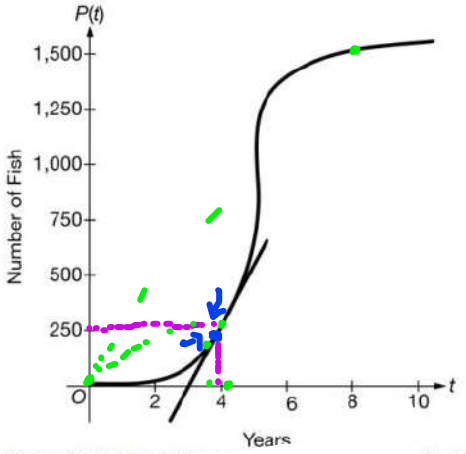
1.




The size of a population of fisl , $P$, where $P(t)$ gives the number of fish and $t$ gives the number of years after the first yea on of the fish to the pond for $0 \le t \le 10$. The graph of the function $P$ and the line tangent to $P$ at re shown above. Which of the following gives the best estimate for the instantaneous rate of change of $t = 4$?

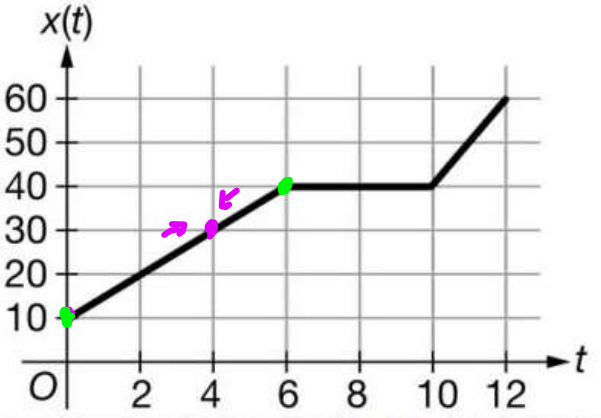
(A) $P(4)$ X

(B) The slope of the line joining $(0, P(0))$ and $(4, P(4))$

(C) The slope of the line joining $(0, P(0))$ and $(8, P(8))$

(D) The slope of the line joining $(3.9, P(3.9))$ and $(4.1, P(4.1))$ ✓ closest together

3.




A particle is moving on the $x$-axis and the position of the particle at time $t$ is given by $x(t)$, whose graph is shown above. Which of the following is the best estimate for the speed of the particle at time $t = 4$?

(A) 0

(B) 5

(C) $\frac{15}{2}$

(D) 10

(0,10) (6,40) $\frac{40-10}{6-0} = \frac{30}{6}$

5

An automobile is driven on a straight road, and the distance traveled by the automobile after time $t = 0$ is given by a quadratic function $s$, where $s(t)$ is measured in feet and $t$ is measured in seconds for $0 \le t \le 12$. Of the following, which gives the best estimate of the velocity of the automobile, in feet per second, at time $t = 8$ seconds?

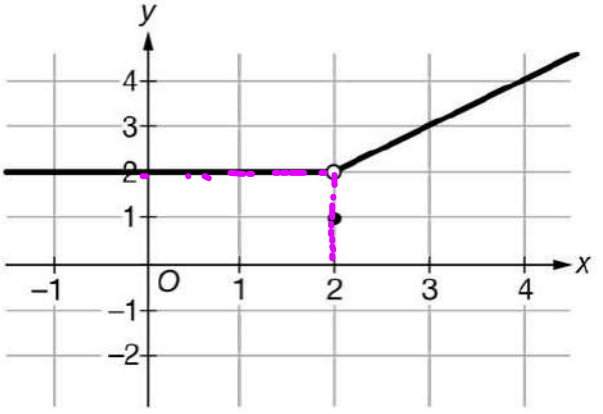
(A) $s(8)$ ✗

(B) $\frac{s(8)}{8}$ ✗

(C) $\frac{s(12)-s(2)}{12-2}$

(D) $\frac{s(9)-s(7)}{9-7}$ ✓ Closest smaller secant line

1.




Graph of $f$

The graph of the function $f$ is shown above. What is $\lim_{x \to 2} f(x)$ ?

(A) 0

(B) 1

(C) 2

(D) The limit does not exist.

Of the following tables, which best reflects the values of a function $g$ for which $\lim_{x \to 9} g(x) = 5$ ?

$x \to 9$

(A)

| $x$ | 4.85 | 4.90 | 4.95 | 4.99 | 5.01 | 5.05 | 5.10 | 5.15 |
|---|---|---|---|---|---|---|---|---|
| $g(x)$ | 8.700 | 8.800 | 8.900 | 8.980 | 9.020 | 9.100 | 9.200 | 9.300 |

(B)

| $x$ | 8.85 | 8.90 | 8.95 | 8.99 | 9.01 | 9.05 | 9.10 | 9.15 |
|---|---|---|---|---|---|---|---|---|
| $g(x)$ | 4.925 | 4.950 | 4.975 | 4.995 | 5.005 | 5.025 | 5.050 | 5.075 |

(C)

| $x$ | 8.85 | 8.90 | 8.95 | 8.99 | 9.01 | 9.05 | 9.10 | 9.15 |
|---|---|---|---|---|---|---|---|---|
| $g(x)$ | 4.950 | 4.967 | 4.983 | 4.997 | 10.030 | 10.070 | 10.120 | 10.170 |

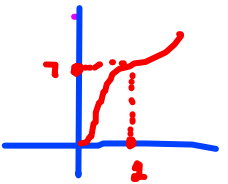
(D)

| $x$ | 8.85 | 8.90 | 8.95 | 8.99 | 9.01 | 9.05 | 9.10 | 9.15 |
|---|---|---|---|---|---|---|---|---|
| $g(x)$ | 6.667 | 10.000 | 20.000 | 100.000 | 4.570 | 4.590 | 4.615 | 4.640 |

Let $f$ be a function that is defined for all real numbers $x$. Of the following, which is the best interpretation of the statement $\lim_{x \to 2} f(x) = 7$?

(A) The value of the function $f$ at $x = 2$ is 7.

(B) The value of the function $f$ at $x = 7$ is 2.

(C) As $x$ approaches 2, the values of $f(x)$ approach 7.

(D) As $x$ approaches 7, the values of $f(x)$ approach 2.