Suppose $d(t) = 40t$ represents miles traveled after t hours.

Average velocity is _____

Instantaneous velocity at $t = t_0$ is _____

Suppose $d(t) = t^2$ represents miles traveled after t hours.

t	change in time btwn $t_0 = 0$ and t	change in distance btwn $t_0 = 0$ and t	average velocity btwn $t_0 = 0$ and t
2	$2 - 0$	$2^2 - 0^2$	$\frac{2^2-0^2}{2-0} = 2$
1	$1 - 0$	$1^2 - 0^2$	$\frac{1^2-0^2}{1-0} = 1$
.5	$.5 - 0$	$(.5)^2 - 0^2$	$\frac{(.5)^2-0^2}{.5-0} = .5$
.1	$.1 - 0$	$(.1)^2 - 0^2$	$\frac{(.1)^2-0^2}{.1-0} = .1$
.01	$.01 - 0$	$(.01)^2 - 0^2$	$\frac{(.01)^2-0^2}{.01-0} = .01$

Instantaneous velocity at $t_0 = 0$ is _____

Suppose $d(t) = t^2$ represents miles traveled after t hours.

t	change in time btwn $t_0 = 2$ and t	change in distance btwn $t_0 = 2$ and t	average velocity btwn $t_0 = 2$ and t
4	$4 - 2$	$4^2 - 2^2$	$\frac{4^2-2^2}{4-2} = 6$
3	$3 - 2$	$3^2 - 2^2$	$\frac{3^2-2^2}{3-2} = 5$
2.5	$2.5 - 2$	$(2.5)^2 - 2^2$	$\frac{(2.5)^2-2^2}{2.5-2} = 4.5$
2.1	$2.1 - 2$	$(2.1)^2 - 2^2$	$\frac{(2.1)^2-2^2}{2.1-2} = 4.1$
1.9	$1.9 - 2$	$(1.9)^2 - 2^2$	$\frac{(1.9)^2-2^2}{1.9-2} = 3.9$
1.5	$1.5 - 2$	$(1.5)^2 - 2^2$	$\frac{(1.5)^2-2^2}{1.5-2} = 3.5$
1	$1 - 2$	$1^2 - 2^2$	$\frac{1^2-2^2}{1-2} = 3$

Instantaneous velocity at $t_0 = 2$ is _____

SLOPE OF SECANT LINE = AVERAGE VELOCITY

SLOPE OF TANGENT LINE = INSTANTANEOUS VELOCITY

in general, SLOPE = RATE OF CHANGE

SLOPE OF SECANT LINE = AVERAGE RATE OF CHANGE

SLOPE OF TANGENT LINE = INSTANTANEOUS RATE OF CHANGE