

Quiz # 2: SOLUTIONS

1. (a)

$$\frac{24.60 - 0}{2 - 0} = 12.30 \text{ m/s}$$

(b)

$$\frac{9.02 - 0}{1 - 0} = 9.02 \text{ m/s}$$

(c) No. The statement of the question includes “launched at time $t = 0$ ”. Therefore the instantaneous velocity at $t = 0$ must be zero, as it is at rest until then. Speaking in terms of the ratio of values, 9.02 m/s is infinitely larger than the instantaneous velocity at time $t = 0$. It is also is hugely larger than, for example, the average velocity on the interval $[0, 0.1]$. (In fact the value 9.02 m/s is probably about right for the instantaneous velocity at 0.5 seconds.)

2. The sentence should be *very* close to:

the values of $f(x)$ can be made as close as one wishes to L by choosing x sufficiently close to, but not equal to, a .

3. The function should have an open circle and a solid dot at different y -values above the point $x = 1$ on the x -axis. The solid dot should be at height $y = 2$ and have the function coming in continuously from the left. The open circle should be at height $y = -2$ and have the function going out continuously to the right.

4. $+\infty$ (because $\cos x$ is nearly $+1$ and $\sin x$ is nearly zero, but positive, when x is close to zero but positive).