

Mathematics 122

Quiz 25

Name: Key

You must show your work to get full credit.

A car traveling at 44 feet/second ($= 30$ mph) applies the breaks. t seconds after the breaks are applied its velocity is v is given by the following table.

t in seconds	0.0	0.5	1.0	1.5	2.0
v in feet/second	44	33	22	11	0

1. For the full 2 seconds give

An upper bound for the distance traveled: 55

A lower bound for the distance traveled: 33

A best guess at the distance traveled: 44

2. For the first second (that is $0 \leq t \leq 1.0$) give

An upper bound for the distance traveled: 38.5

A lower bound for the distance traveled: 27.5

A best guess at the distance traveled: 33

3. For the first second (that is $1.0 \leq t \leq 2.0$) give

An upper bound for the distance traveled: 16.5

A lower bound for the distance traveled: 5.5

A best guess at the distance traveled: 11

$$\begin{aligned} 1. \text{ upper bound } & .5(44+33+22+11) = 55 \\ \text{lower bound } & .5(33+22+11+0) = 33 \\ \text{Best guess} & = \frac{55+33}{2} = 44 \end{aligned}$$

$$\begin{aligned} 2. \text{ upper bound } & = .5(44+33) = 38.5 \\ \text{Lower bound} & = .5(33+22) = 27.5 \\ \text{Best guess} & = \frac{38.5+27.5}{2} = 33 \end{aligned}$$

$$\begin{aligned} 3. \text{ upper bound } & = .5(22+11) = 16.5 \\ \text{Lower bound} & = .5(11+0) = 5.5 \\ \text{Best guess} & = \frac{16.5+5.5}{2} = 11 \end{aligned}$$