Response Time

If you send a signal over a fiber optic cable to another computer and get a response, the response time, $t_{response}$, depends on three things:

a) the distance between you and the computer, L

b) the velocity of light traveling through the cable, v

c) the amount of time it takes the other computer to process your signal, $t_{processing}$

The equation you would use to find the response time is this:

$$t_{response} = t_{processing} + \frac{2L}{v}$$

Note that the velocity of light in fiber optic cable, v, is about 2/3 of the velocity of light in a vacuum, which makes it approximately equal to 200,000,000 meters/second.

1. Calculate $t_{response}$ for the given values of L and $t_{processing}$:

L	$t_{processing}$	$t_{response}$
500,000 meters	0.013 seconds	
8,000,000 meters	0.005 seconds	
2,000 meters	0.002 seconds	
20,000,000 meters	0.04 seconds	

2. Solve the equation to find the unknown value:

L	$t_{processing}$	$t_{response}$
750,000	?	0.0325
?	0.001	0.00195
?	0.015	0.016
50,000,000	?	0.503