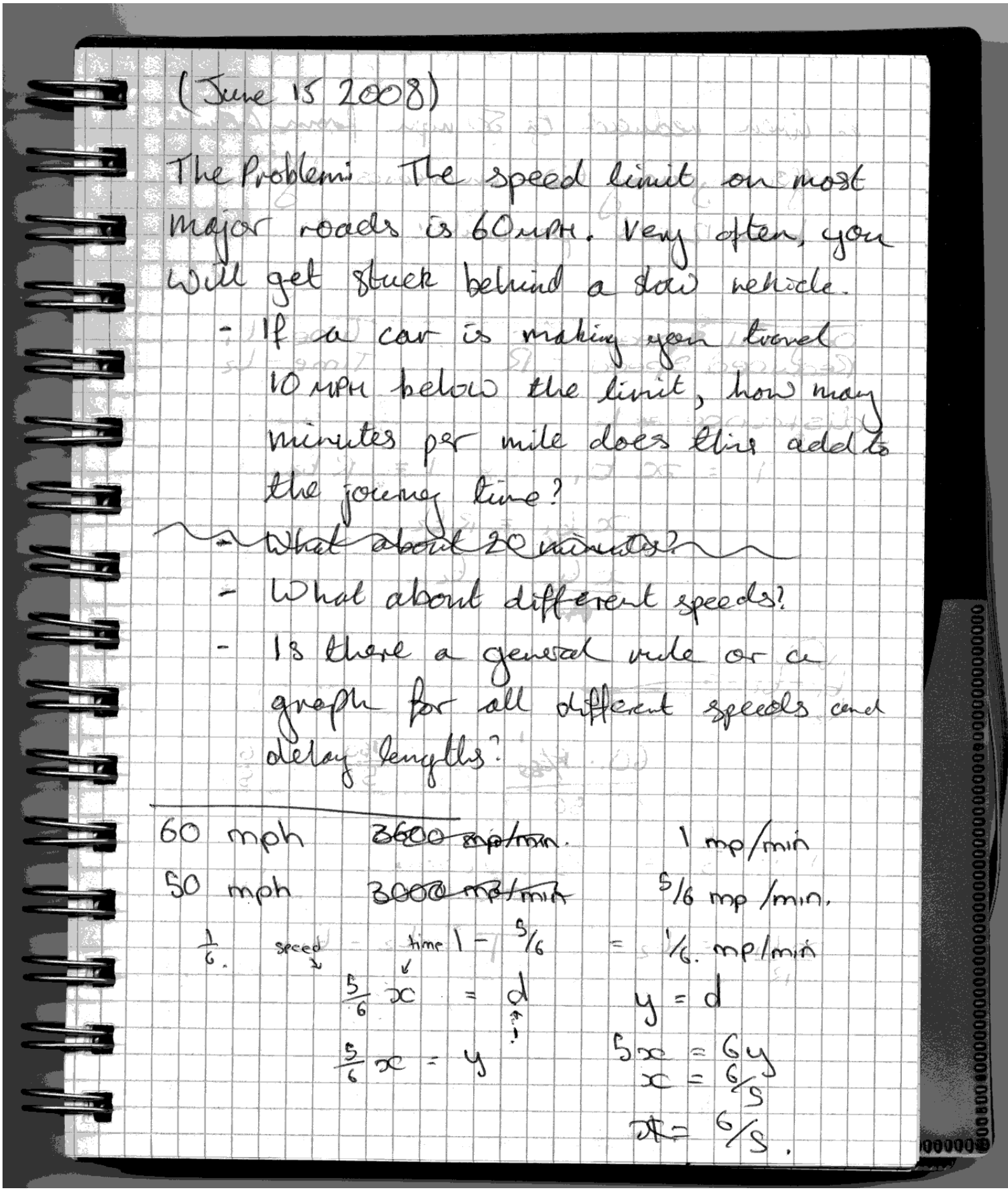
Driving Below the Speed Limit Problem	Page 1 of 3

Please be aware, these calculations were done early in the morning, on a cruise ship (so probably after a night of drinking) in the middle of the Caribbean Sea; so there very well may be mistakes! If you find any, please let us know:
admin@davidclaxton.co.uk



(June 15 2008)

The Problem: The speed limit on most major roads is 60 MPH. Very often, you will get stuck behind a slow vehicle.

- If a car is making you travel 10 MPH below the limit, how many minutes per mile does this add to the journey time?
- ~~What about 20 minutes?~~
- What about different speeds?
- Is there a general rule or a graph for all different speeds and delay lengths?

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60 mph ~~3600 mp/min~~ 1 mp/min

50 mph ~~3000 mp/min~~ 5/6 mp/min.

1/6. speed ↘ time ↙ 1 − 5/6 = 1/6. mp/min

$\frac{5}{6}x = d$ ← !

$\frac{5}{6}x = y$

$y = d$

$5x = 6y$

$x = \frac{6}{5}$

$x = 6/5$.

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i.e. When reduced to 50 mph from 60 mph, your journey time increases by ~~1 min~~ 12 secs per mile.

Original speed = x Time = t_1
Reduced speed = R Time = t_2

distance = 1.

$1 = x t_1$ $\quad 1 = R t_2$

$x t_1 = R t_2$

$\frac{x t_1}{R} = t_2$

$t_1 - t_2 =$

$t_2 - t_1$

$\frac{60 \cdot 1}{50} = \frac{160}{50} = \frac{6}{5}$.

$1 - \frac{6}{5} = \frac{1}{5}$ = 12 secs.

$\frac{x t_1}{R} = t_2$ $\quad T = t_2 - t_1$

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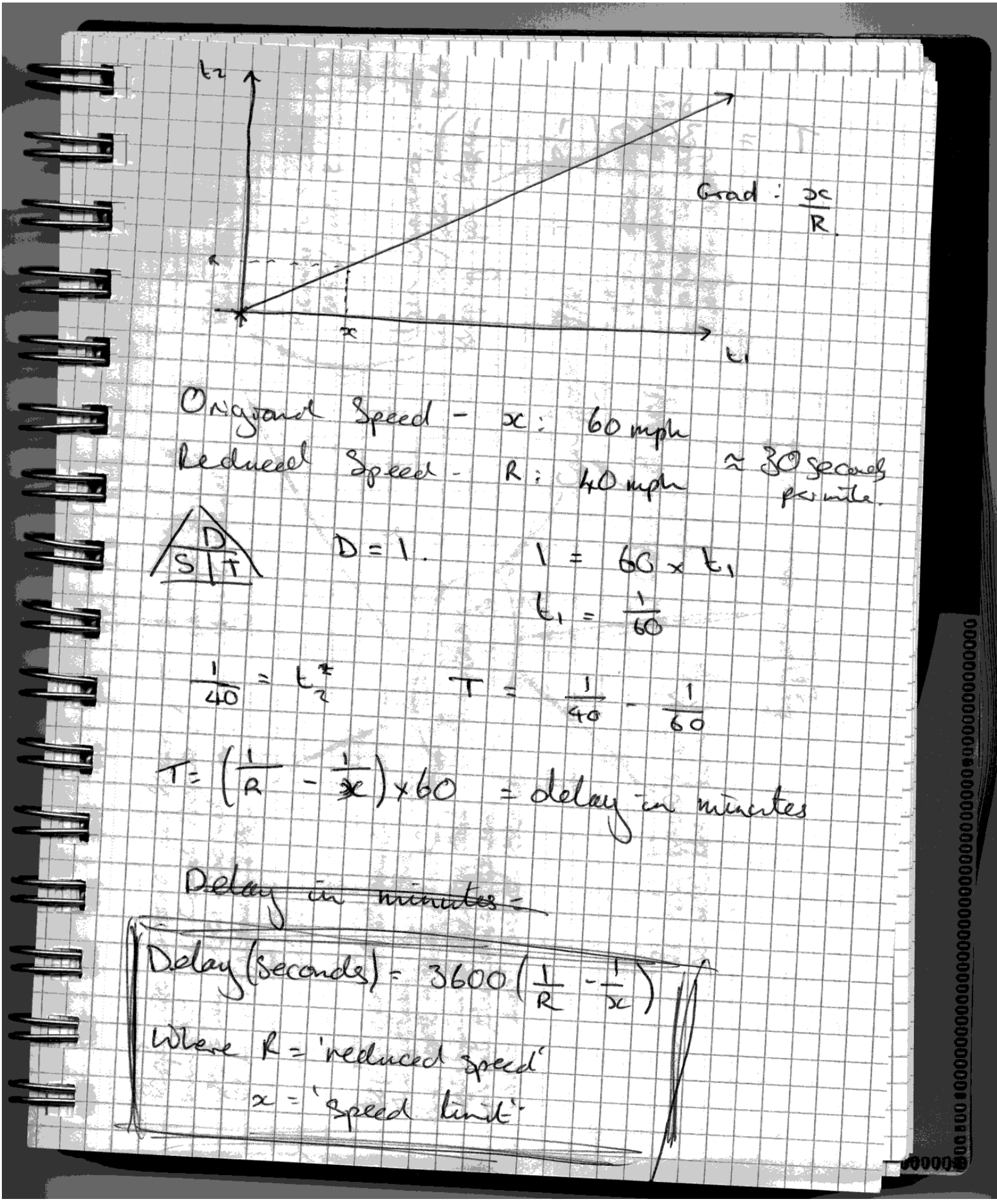

Original Speed - x: 60 mph
Reduced Speed - R: 40 mph ≈ 30 seconds per mile.

$D = 1$. $\quad 1 = 60 \times t_1$

$t_1 = \frac{1}{60}$

$\frac{1}{40} = t_2$ $\quad T = \frac{1}{40} - \frac{1}{60}$

$T = \left(\frac{1}{R} - \frac{1}{x}\right) \times 60$ = delay in minutes

Delay in minutes =

$$\text{Delay (seconds)} = 3600\left(\frac{1}{R} - \frac{1}{x}\right)$$

Where R = 'reduced speed'
x = 'speed limit'