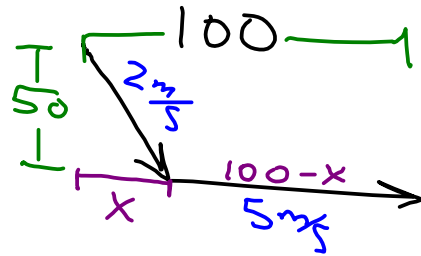


## § 10.4 Minimum Path



$$v = d/t$$

$$t = d/v$$

$$t = \frac{\sqrt{50^2 + x^2}}{2 \frac{m}{s}} + \frac{100 - x}{5 \frac{m}{s}}$$

$$\frac{dt}{dx} = \frac{x}{(2 \frac{m}{s}) \sqrt{50^2 + x^2}} - \frac{1}{5 \frac{m}{s}} = 0$$

$$\frac{x}{2 \sqrt{50^2 + x^2}} = \frac{1}{5} \Rightarrow \frac{5x}{2} = \sqrt{50^2 + x^2}$$

$$\Rightarrow \frac{25x^2}{4} = 50^2 + x^2$$

$$21x^2 = 4(2500) \Rightarrow x = \pm \sqrt{\frac{10000}{21}}$$

$$x = 21.82$$

