



In all the problems the line  $BE$  is the 6 foot woman. In the first four problems the light is at  $C$  and the shadow is the line  $AE$ . In the last four problems the light is at  $A$  and the shadow is the line  $CD$ . Similar triangles always gives the same equation

$$\frac{AE}{BE} = \frac{AD}{CD} \quad \text{or} \quad \frac{y}{6} = \frac{x+y}{h}$$

Usually exactly two of the three variables  $x$ ,  $y$  or  $h$  vary, while the third is constant. But in problems 5 and 6 the constant is the sum  $x + y$  and all three of  $x$ ,  $y$  and  $h$  vary.

Problem	Shadow	Varying	Constant	Given	Want
1	$y$	$x$ and $y$	$h$	$\frac{dx}{dt} = 2$	$\frac{dy}{dt}$ when $x = 20$
2	$y$	$x$ and $y$	$h$	$\frac{dx}{dt} = -3$	$-\frac{dy}{dt}$ when $x = 20$
3	$y$	$h$ and $y$	$x$	$\frac{dh}{dt} = -2$	$\frac{dy}{dt}$ when $h = 30$
4	$y$	$h$ and $y$	$x$	$\frac{dh}{dt} = 3$	$-\frac{dy}{dt}$ when $h = 30$
5	$h$	$x$ , $y$ and $h$		$\frac{dx}{dt} = -2$	$\frac{dh}{dt}$ when $x = 20$ and $y = 10$
6	$h$	$x$ , $y$ and $h$		$\frac{dx}{dt} = 3$	$\frac{dh}{dt}$ when $x = 20$ and $y = 10$
7	$h$	$y$ and $h$	$x$	$\frac{dy}{dt} = -3$	$\frac{dh}{dt}$ when $x = 20$ and $y = 10$
8	$h$	$y$ and $h$	$x$	$\frac{dy}{dt} = 2$	$\frac{dh}{dt}$ when $x = 20$ and $y = 10$