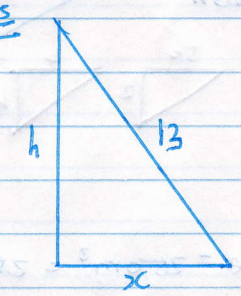
EG) A 13 ft ladder is leaning against a vertical wall when Jack begins pulling the foot of the ladder away from the wall at a rate of 0.5 ft/sec. How fast is the top of the ladder sliding down the wall when the foot of the ladder is 5 ft from the wall?

Ans



Given $\frac{dx}{dt} = 0.5$ ft/sec ; To find $\frac{dh}{dt}\Big|_{x=5}$

$x^2 + h^2 = 169$

$2x\frac{dx}{dt} + 2h\frac{dh}{dt} = 0$

when $x=5$, $h=12$

$(2\times5\times0.5) + 2\times12\times\frac{dh}{dt} = 0$

$5 + 24\frac{dh}{dt} = 0 \Rightarrow \frac{dh}{dt} = \frac{-5}{24}$ //