Gravel is being dumped from a conveyor belt at a rate of 30 cubic feet per minute. It forms a pile in the shape of a right circular cone whose base diameter and height are always the same. How fast is the height of the pile increasing when the pile is 10 feet high? Recall that the volume of a right circular cone with height h and radius of the base r is given by V=1/3 πr^2h.

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"diameter and height are always the same", then h=d → d=2r → r=h/d.

h=10; r=5;

V= 1/3 πr^2h → V=1/3 π*(5^2)*10=261.66

The average velocity v of an object moving through a displacement Δs during a time interval Δt is described by the formula:

U=Δs/Δt → s=V;

$$30 - 1 \text{ minute},$$

$$261.66 - x \text{ minutes}$$

X=(261.66*1)/30=8,722 (minutes).