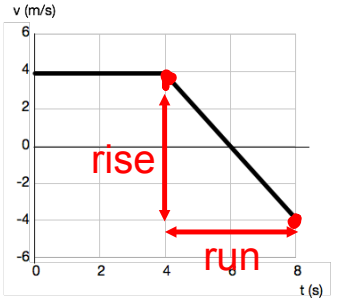
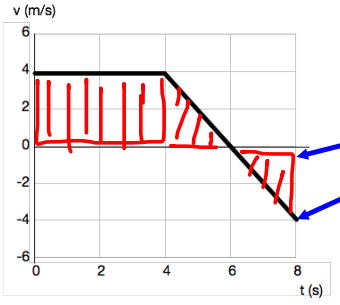
Can we get everything we need from the velocity graph?



Slope is acceleration.

$$a = \frac{\text{rise}}{\text{run}}$$

(If it's a downslope, the slope is negative.)

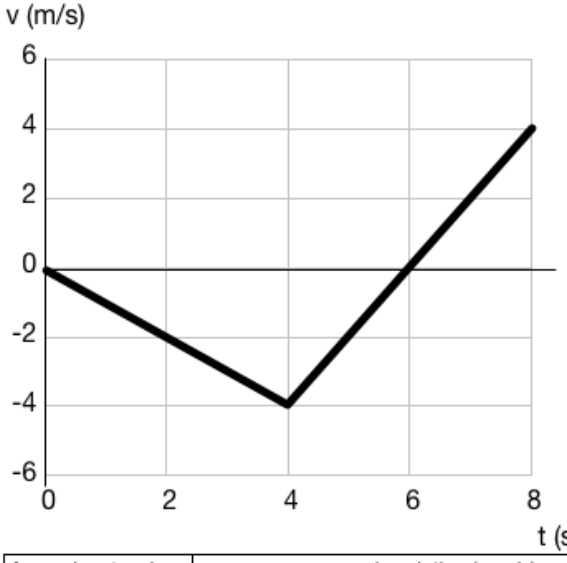


Area is change in position.

Between graph and 0-line.

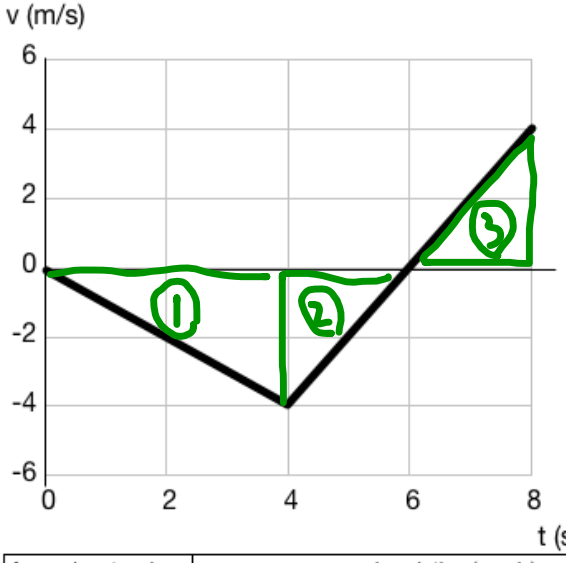
Break it up into triangles and rectangles to make the calculation easier.

Area below the 0-line counts as negative (going left).



total change in position calculation

from when to when	description (words)	acceleration calculation



total change in position calculation
Area 1 = 1/2bh = (1/2)(4 s)(-4 m/s) = - 8 m
Area 2 = 1/2bh = (1/2)(2 s)(-4 m/s) = - 4 m
Area 3 = 1/2bh = (1/2)(2 s)(4 m/s) = 4 m
Total change in position = -8 m + -4 m + 4 m = -8 m

from when to when	description (words)	acceleration calculation
0 to 4 s	Speed up, moving left.	$\frac{\text{rise: } -4 \text{ m/s}}{\text{run: } 4 \text{ s}} = -1 \text{ m/s/s}$
4 to 6 s	Slow down - moving left.	$\frac{\text{rise: } 4 \text{ m/s}}{\text{run: } 2 \text{ s}} = 2 \text{ m/s/s}$
6 to 8 s	Speed up, moving right.	$\frac{\text{rise: } 4 \text{ m/s}}{\text{run: } 2 \text{ s}} = 2 \text{ m/s/s}$