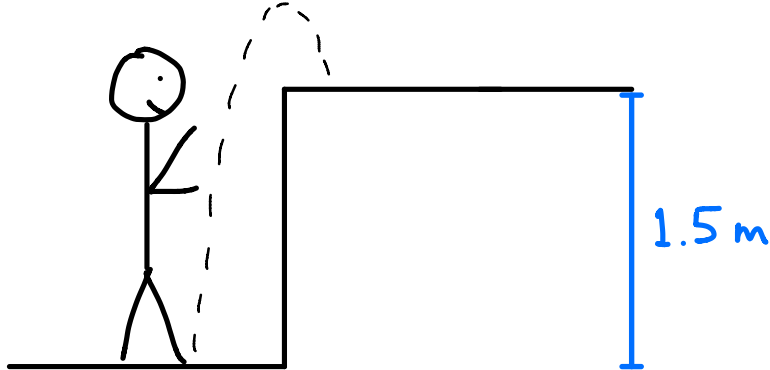
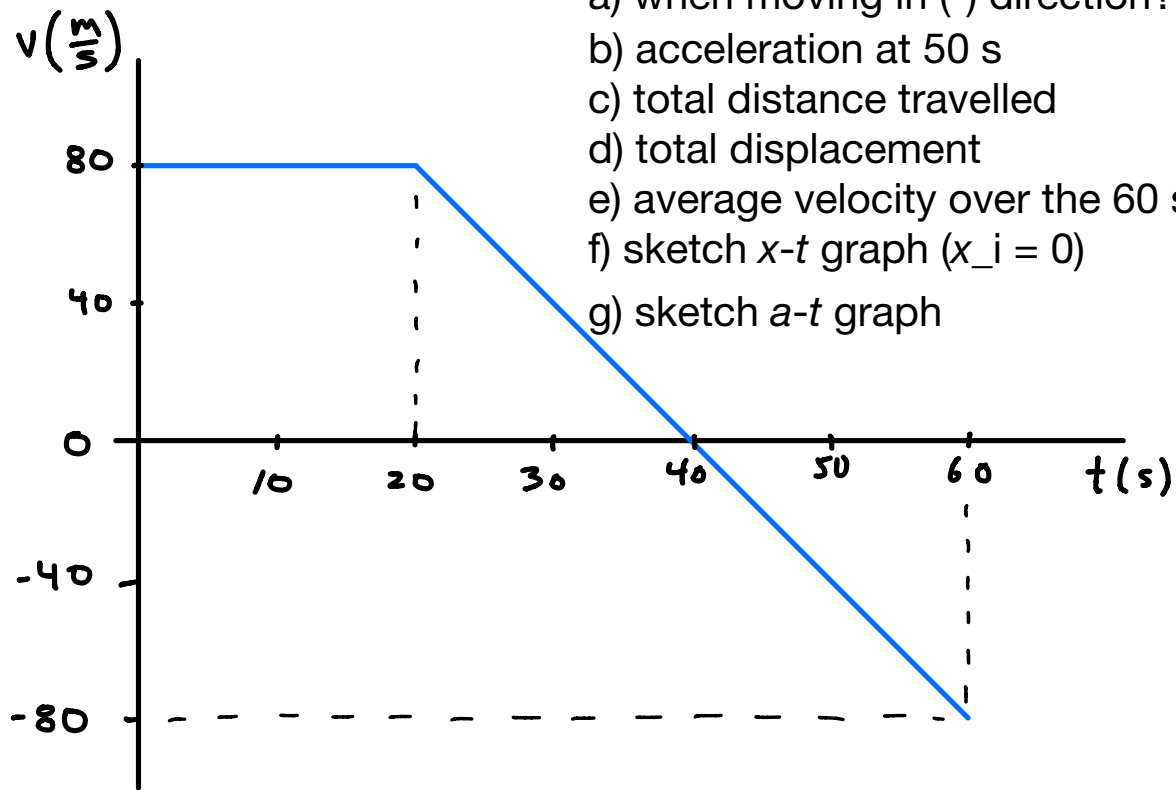


A student jumps up with an initial upwards velocity of 6.0 m/s and lands on a 1.5 m high platform as shown.



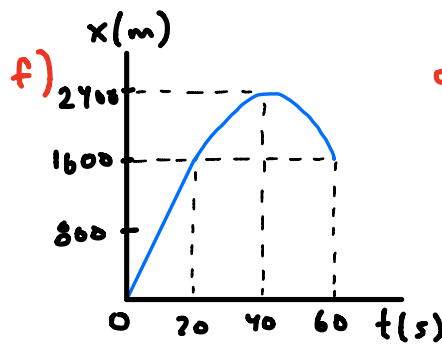
- a) What maximum height does he reach?
- b) How long is the student in the air?

a) 1.84 m
b) 0.87 s

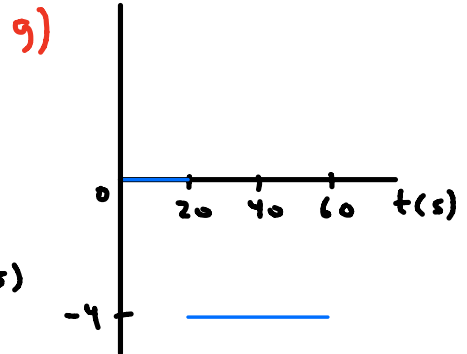


- a) when moving in (-) direction?
- b) acceleration at 50 s
- c) total distance travelled
- d) total displacement
- e) average velocity over the 60 s
- f) sketch $x-t$ graph ($x_i = 0$)
- g) sketch $a-t$ graph

- a) 40-60s
- b) -4 m/s^2
- c) 3200 m
- d) 1600 m
- e) $26.7 \frac{\text{m}}{\text{s}}$



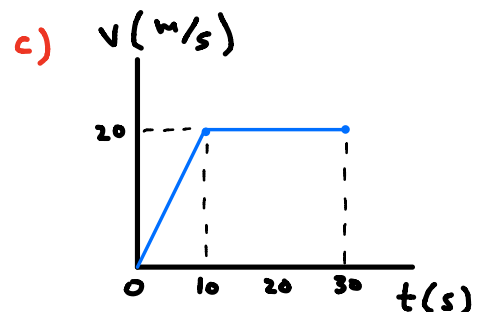
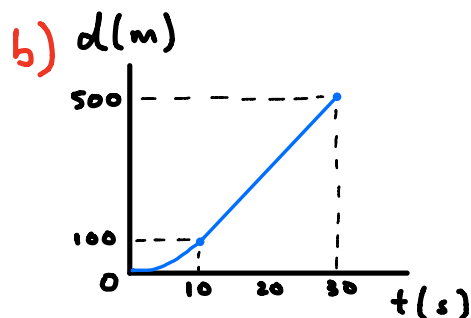
$a (\text{m/s}^2)$



A car starts from rest and accelerates at 2.0 m/s^2 for 10 s. It then stops accelerating and travels at the same velocity for 20 s.

- What is the total displacement of the car?
- Sketch the displacement of the car vs. time.
- Sketch the acceleration of the car vs. time.

a) 500 m



A soft tennis ball is dropped onto a hard floor from a height of 1.46 m and rebounds to a height of 1.07 m.

- a) Calculate its velocity v_1 just before it strikes the floor.
- b) Calculate its velocity v_2 just after it leaves the floor on the way back up.
- c) Calculate its acceleration during contact with the floor if the contact lasts 3.0 ms.
- d) How much did the ball compress during its collision with the floor, assuming the floor is absolutely rigid?

a) 5.35 m/s DOWN

b) 4.58 m/s UP

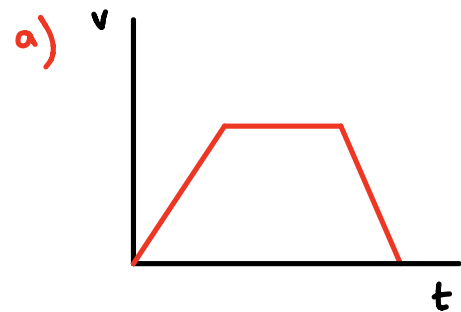
c) 3310 m/s² UP

d) 0.00432 m

A car starts from rest at a stop sign. It accelerates at 2 m/s^2 to a speed of 50 km/h , then travels at a constant speed and finally slows down at a rate of 3.5 m/s^2 for the next stop sign.

a) Sketch a qualitative velocity vs. time graph.

b) If the total driving time is 65 s , what is the distance travelled between the two stop times?



b) 827 m

A bicycle racer sprints at the end of a race to clinch a victory. The racer has an initial velocity of 12.0 m/s and accelerates at a rate of 0.6 m/s^2 for 6.5 s .

- a) What is his final velocity?
- b) The racer continues at this velocity until the finish line. If he was 291 m from the finish line when he started to accelerate, how much time did he save?
- c) One other racer was 10 m ahead when the winner started to accelerate, but he was unable to accelerate, and travelled at 12.3 m/s until the finish line. How far ahead of him (in seconds) did the winner finish?
- d) How far ahead of him (in meters) did the winner finish?

a) $15.9 \frac{\text{m}}{\text{s}}$

b) 5.15 s

c) 3.75 s

d) 46.1 m