

1/15/2020

7.2: Backwards in Time

A traffic safety engineer was studying travel patterns along a highway. She set up a camera and recorded the speed and direction of cars and trucks that passed by the camera. Positions to the east of the camera are positive, and to the west are negative.

1. Here are some positions and times for one car:

Velocity
feet per sec

position (feet)	-180	-120	-60	0	60	120
time (seconds)	-3	-2	-1	0	1	2

a. In what direction is this car traveling?

From west to east (negative to positive)

b. What is its velocity?

60 feet per second

2.

a. What does it mean when the time is zero?

The car has not moved yet

b. What could it mean to have a negative time?

The car has not passed the camera yet

3. Here are the positions and times for a different car whose velocity is -50 feet per second:

position (feet)	+150	+100	+50	0	-50	-100
time (seconds)	-3	-2	-1	0	1	2

EAST

West

a. Complete the table with the rest of the positions.

b. In what direction is this car traveling? Explain how you know.

E → W

neg. \times pos. = neg.

neg. \times neg. = pos.

pos. \times neg. = neg.

4. Complete the table for several different cars passing the camera.

	velocity (meters per second)	time after passing the camera (seconds)	ending position (meters)	equation
car C	+25 E	+10	+250 E	$25 \cdot 10 = 250$
car D	-20 W	+30	-600 W	$-20 \cdot 30 = -600$
car E	+32 E	-40	-1280	$32 \cdot -40 = -1280$
car F	-35 W	-20	700	$-35 \cdot -20 = 700$
car G	-15 W	-8	120	$-15 \cdot -8 = 120$

$$\begin{array}{r} +1 \\ 35 \\ \times 20 \\ \hline 700 \\ \hline 700 \\ \hline 700 \end{array}$$

$$\begin{array}{r} 40 \\ \times 32 \\ \hline 800 \\ \hline 1200 \\ \hline 1280 \end{array}$$

a. If a car is traveling east when it passes the camera, will its position be positive or negative 60 seconds before it passes the camera?

b. If we multiply a negative number and a positive number, is the result positive or negative?

6.

a. If a car is traveling west when it passes the camera, will its position be positive or negative 60 seconds before it passes the camera?

b. If we multiply two negative numbers, is the result positive or negative?

7.3: Cruising

m.openup.org/1/7-5-9-3



Around noon, a car was traveling -32 meters per second down a highway. At exactly noon (when time was 0), the position of the car was 0 meters.

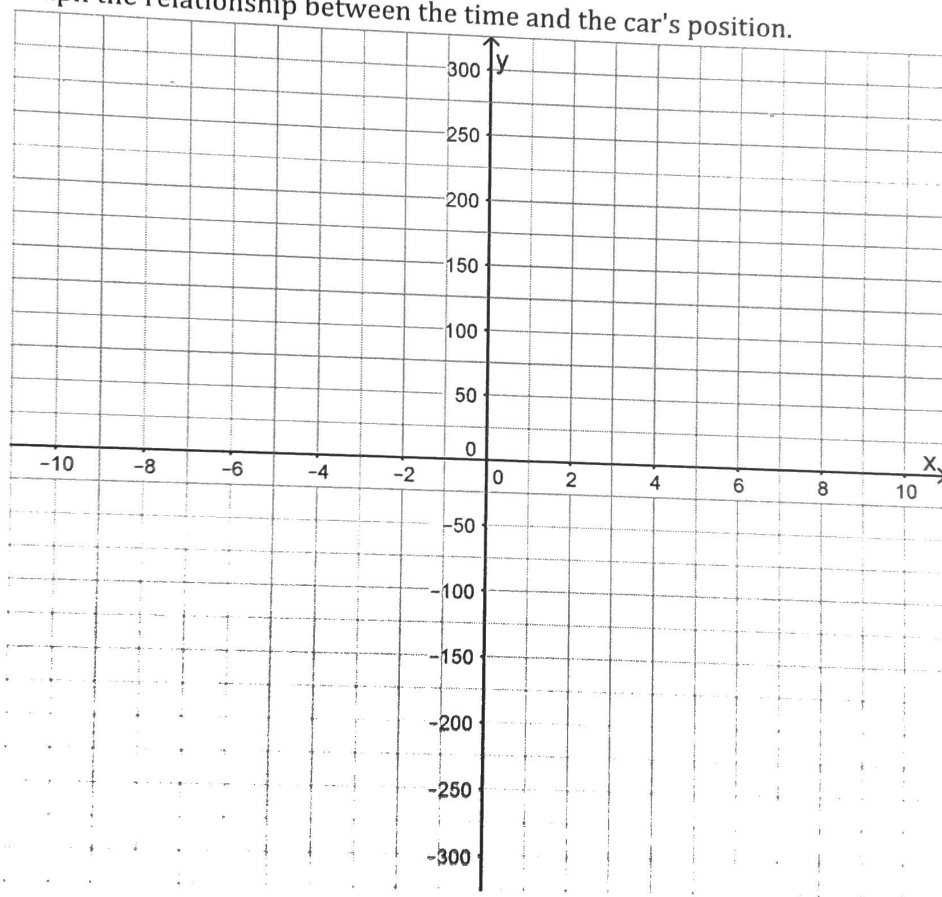
1. Complete the table.

NOON = 0

$\times 32$

time (s)	-10	-7	-4	-1	2	5	8	11
position (m)	320	224	128	32	-64	-160	-256	-352

2. Graph the relationship between the time and the car's position.



$$\begin{array}{r} 1 \\ 32 \\ \times 7 \\ \hline 224 \end{array}$$

$$\begin{array}{r} 1 \\ 32 \\ \times 4 \\ \hline 128 \end{array}$$

$$\begin{array}{r} 1 \\ 32 \\ \times 5 \\ \hline 160 \end{array}$$

- What was the position of the car at -3 seconds?
- What was the position of the car at 6.5 seconds?

