

MOTION

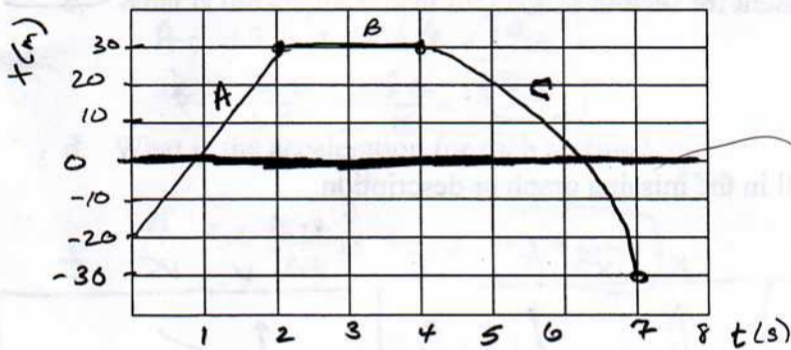
Practice: Position vs. Time Graphs

Name Key

1. For each example, sketch the missing graph, or give the missing description of motion.

DESCRIPTION	pos. vs time GRAPH
CONSTANT SPEED, "BACKWARD"	
SLOWING DOWN, "FORWARD"	
SLOWING DOWN, "BACKWARD"	

2. Use the graph below to answer the questions.



a. Describe the motion for each section.

A: const. speed fwd
 B: at rest

C: speeding up, backward.

b. What is the average velocity for each section?

A: $\bar{v} = \frac{\Delta x}{\Delta t} = \frac{+50\text{m}}{2\text{s}} = \boxed{25\text{m/s}}$

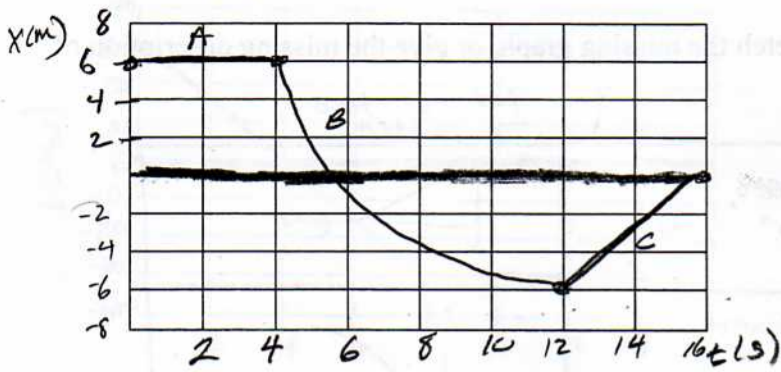
B: $\bar{v} = \frac{\Delta x}{\Delta t} = \boxed{0}$

C: $\bar{v} = \frac{\Delta x}{\Delta t} = \frac{-60\text{m}}{3\text{s}} = \boxed{\bar{v} = -20\text{m/s}}$

c. What is the displacement for section C?

-60m

3. Use the graph below to answer the questions.



a. Describe the motion for each section.

A: At rest

C: CONST. SPEED, FWP.

B: SLOWING DOWN, BKWD

b. What is the average velocity for each section?

A $\bar{v} = 0$

B: $\bar{v} = \frac{\Delta x}{\Delta t} = \frac{-12\text{m}}{8\text{s}} = -1.5\text{m/s}$

C: $\bar{v} = \frac{\Delta x}{\Delta t} = \frac{+6\text{m}}{4\text{s}} = +1.5\text{m/s}$

c. What is the displacement for section C?

+6m

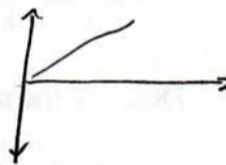
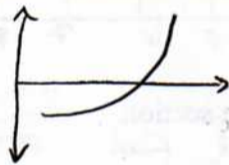
4. For each example, fill in the missing graph or description.

Description

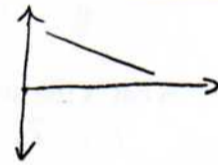
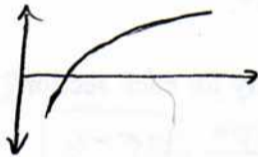
x vs t

v vs. t

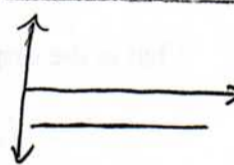
speeding up,
forward



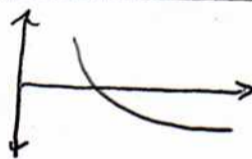
slowing,
fwd



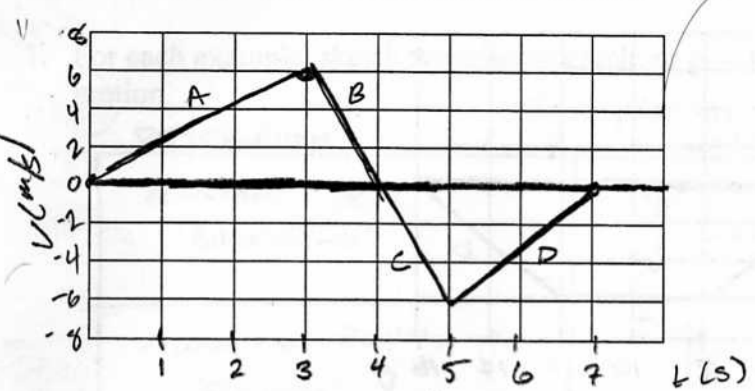
const speed,
bkwd



slowing down,
bkwd



5. Use the graph below to answer the questions.



a. Describe the motion for each section.

A: speed up, fwd

C: speed up, BKWD

B: SLOWING DOWN, FWD

D: SLOW DOWN, BKWD

b. What is the average velocity for each section? - MIDPOINT

A: 3 m/s

C: -3 m/s

B: 3 m/s

D: -3 m/s

c. What is the displacement for each section? - Area

A: $\frac{b \cdot h}{2} = \frac{3 \cdot 6}{2} = 9\text{m}$

C: $\frac{b \cdot h}{2} = \frac{1 \cdot 6}{2} = 3\text{m}$

B: $\frac{b \cdot h}{2} = \frac{1 \cdot 6}{2} = 3\text{m}$

D: $\frac{b \cdot h}{2} = \frac{2 \cdot 6}{2} = 6\text{m}$

d. What is the acceleration for each section? - slope

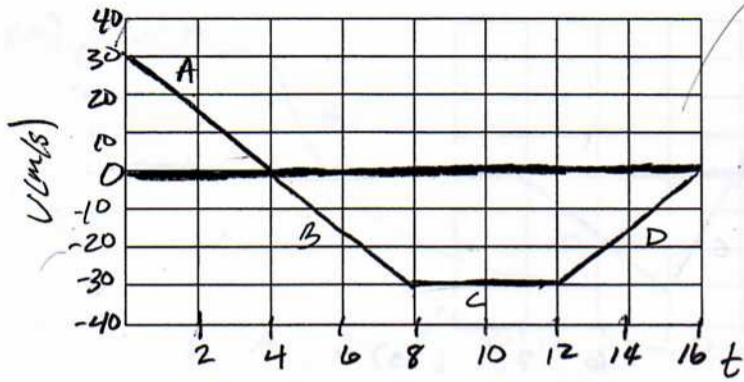
A: $a = \frac{\Delta v}{\Delta t} = \frac{6\text{m/s}}{3\text{s}} = 2\text{m/s}^2$

B: $a = \frac{\Delta v}{\Delta t} = \frac{-6\text{m/s}}{1\text{s}} = -6\text{m/s}^2$

C: $a = \frac{\Delta v}{\Delta t} = \frac{-6\text{m/s}}{1\text{s}} = -6\text{m/s}^2$

D: $a = \frac{\Delta v}{\Delta t} = \frac{6\text{m/s}}{2\text{s}} = 3\text{m/s}^2$

6. Use the graph below to answer the questions.



a. Describe the motion for each section.

A: slowing, fast C: CONST. SPEED BLWP
 B: SPEEDING UP, BLWP D: SLOWING, BLWP

b. What is the average velocity for each section? (in 10 POINT)

A: 15 m/s C: -30 m/s
 B: -15 m/s D: -15 m/s

c. What is the displacement for each section?

A: $b \cdot h / 2 = 4 \cdot 30 / 2 = 60 \text{ m}$ C: $b \cdot h = 4 \cdot 30 = -120 \text{ m}$
 B: $b \cdot h / 2 = 4 \cdot 30 / 2 = -60 \text{ m}$ D: $b \cdot h / 2 = 4 \cdot 30 / 2 = -60 \text{ m}$

d. What is the acceleration for each section?

$$A: a = \frac{\Delta v}{\Delta t} = \frac{-30 \text{ m/s}}{4 \text{ s}} = -7.5 \text{ m/s}^2$$

$$B: a = \frac{\Delta v}{\Delta t} = \frac{-30 \text{ m/s}}{4 \text{ s}} = -7.5 \text{ m/s}^2$$

$$C: a = \frac{\Delta v}{\Delta t} = 0$$

$$D: a = \frac{\Delta v}{\Delta t} = \frac{+30 \text{ m/s}}{4 \text{ s}} = +7.5 \text{ m/s}^2$$