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## BLM 10-5, Uniform Motion/Problem Solving

**Goal:** Students use the uniform motion formula to solve motion problems.

**Answers:**

1.

$\Delta t$	$\Delta \vec{d}$	$\vec{v}_{av}$
3.0 s	+12 m	+4.0 m/s
7.0 s	+28 m	+4.0 m/s
15.1 s	+30.2 m	+2.00 m/s
1.5 h	+75 km	+50 km/h
1.7 h	+84 km	+49 km/h
8 h	+120 km	+15 km/h

2. (a) 8.47 m/s

(b) 110 km

(c) 27 s

3. 62 m

4. (a) -4.6 m/s

(b) 18 m

(c) 5.6 s

2.

<b>Time (s)</b>	<b><math>\Delta t</math> (s)</b>	<b><math>\Delta \vec{d}</math> (m)</b>	<b><math>\vec{v}_{av}</math> (m/s)</b>
3 to 24	21	+40	+1.9
10 to 26	16	+13	+0.8
14 to 30	16	-50	-3.1

3. (a) The graph is a straight horizontal line.

(b) The displacement is zero.

4. (a) The slope is positive.

(b) The displacement is positive.

5. (a) The slope is negative.

(b) The displacement is negative.

## BLM 10-6, Velocity from Position-Time Graphs/Reinforcement

**Goal:** Students find velocities from different sections of a position-time graph.

**Answers:**

1.

Time (s)	$\Delta t$ (s)	$\Delta \vec{d}$ (m)	$\vec{v}$ (m/s)	Direction of motion (right or left)
0 to 6	6	+20	+3.3	right
6 to 10	4	0	0	—
10 to 14	4	+30	+7.5	right
14 to 20	6	+10	+1.7	right
20 to 24	4	-10	-2.5	left
24 to 30	6	-50	-8.3	left

2.

Time (s)	$\Delta t$ (s)	$\Delta \vec{d}$ (m)	$\vec{v}_{av}$ (m/s)
3 to 24	21	+40	+1.9
10 to 26	16	+13	+0.8
14 to 30	16	-50	-3.1

3. (a) The graph is a straight horizontal line.  
(b) The displacement is zero.
4. (a) The slope is positive.  
(b) The displacement is positive.
5. (a) The slope is negative.  
(b) The displacement is negative.

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## **BLM 10-8, Position-Time Graphs Quiz/Assessment**

**Goal:** Students assess their understanding of position-time graphs.

**Answers:**

1. (a)  $+10 \text{ m/s}$   
(b)  $0 \text{ m/s}$   
(c)  $-25 \text{ m/s}$
2.  $+1.25 \text{ m/s}$
3.  $+7 \text{ m/s}$  (Answers may vary slightly.)
4. A. uniform motion to the right at a speed of  $10 \text{ m/s}$   
B. stationary  
C. uniform motion to the left at a speed of  $25 \text{ m/s}$   
D. stationary  
E. non-uniform motion to the right (speeding up)

### BLM 11-3, Acceleration Problems/ Problem Solving

**Goal:** Students calculate the acceleration of objects that are moving in a straight line.

**Answers:**

1.

$t_i$ (s)	$t_f$ (s)	$\Delta t$ (s)	$v_i$ (m/s)	$\vec{v}_i$ (m/s)	$\Delta \vec{v}$ (m/s)	$\vec{a}_{av}$ (m/s <sup>2</sup> )
10	25	15	0	+12	+12	+0.80
0	40	40	+50	+10	-40	-1
12.5	41.6	29.1	-10.1	+32.4	+42.5	+1.46
9.70	51.9	42.2	+43.7	-12.6	-56.3	-1.33

2. +1.37 m/s<sup>2</sup>

3. -3.66 m/s<sup>2</sup>

4. +52.4 m/s<sup>2</sup>

5. +1.5 m/s<sup>2</sup>

6. -1.2 m/s<sup>2</sup> (to the left)

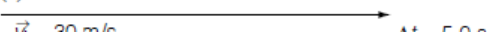
7. +3.1 m/s<sup>2</sup> (upward)

### BLM 11-4, Velocity Vectors and Acceleration/Reinforcement

**Goal:** Students use velocity vectors to determine acceleration.

**Answers:**

1. (a)



### BLM 11-15, Velocity-Time Graph

#### Quiz/Assessment

**Goal:** Students assess their understanding of velocity-time graphs.

**Answers:**

1. 3.3 m/s<sup>2</sup>

2. 0 m/s<sup>2</sup>

3. -5.3 m/s<sup>2</sup>

4. 6.0 m/s<sup>2</sup>

5. 4.7 m/s<sup>2</sup>

6. Answers will vary.

7. -1.1 m/s<sup>2</sup>