PHYSICS 2204
Unit 1: Kinematics
Worksheet 8 : Analyzing Graphs of Motion

STUDENT NAME:_____

$\vec{d}-t$ graphs	$\vec{v}-t$ graphs	Velocity	Acceleration	Example
Stopped				
		$\vec{v}=0$	$\vec{a}=0$	
		$\vec{v}=0$	$\vec{a}=0$	
Constant Velocity				
		$\vec{v}>0$	$\vec{a}=0$	
		$v<0$	$a=0$	
Speeding Up				
		$\vec{v}\geq 0$	$\vec{a}>0$	
		$v\leq 0$	$\vec{a}<0$	
Slowing Down				
		$\vec{v}>0$	$\vec{a}<0$	
		$\vec{v}<0$	$\vec{a}>0$	

1
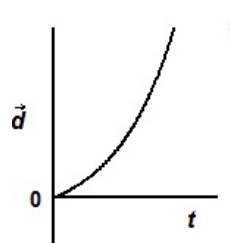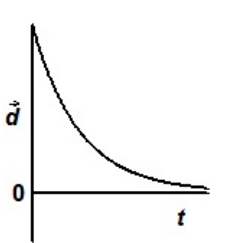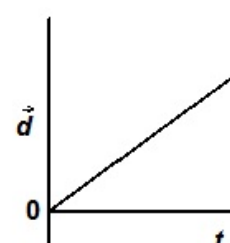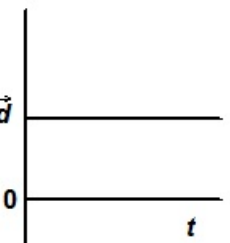
What did you learn about Displacement -Time graphs?

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What information did you learn about velocity time graphs?

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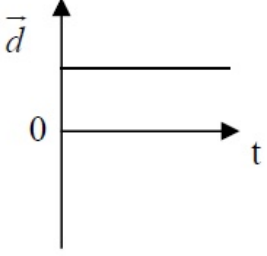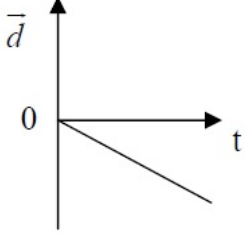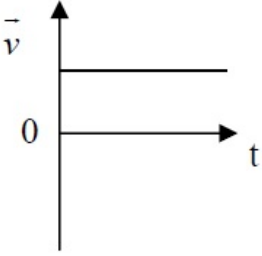
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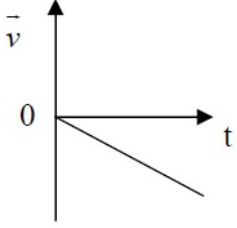
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PART A: MULTIPLE CHOICE

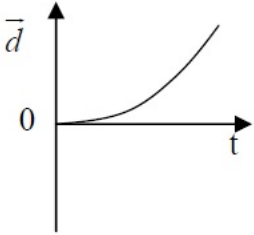Instructions: Shade the letter of the correct answer on the computer scorable answer sheet provided

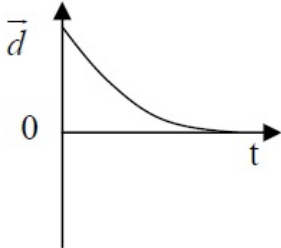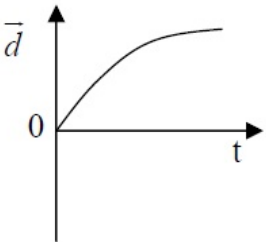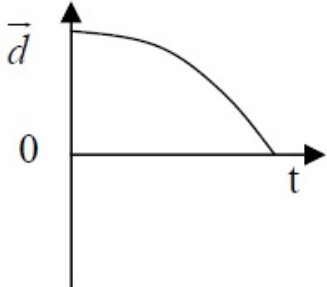1. Which graph represents an object with uniform motion?

2.   Which graph represents an object moving to the right at a constant speed?

(A)	(B)
$\vec{d}$ graph: horizontal line above 0, vs t	$\vec{d}$ graph: line decreasing from 0, vs t

(C)	(D)
$\vec{v}$ graph: horizontal line above 0, vs t	$\vec{v}$ graph: line decreasing from 0, vs t

3.   Which graph represents an object moving to the right and speeding up?

(A)	(B)
$\vec{d}$ graph: upward curving line from 0, vs t	$\vec{d}$ graph: decreasing curve from top, vs t

(C)	(D)
$\vec{d}$ graph: increasing curve leveling off from 0, vs t	$\vec{d}$ graph: decreasing curve from top to t axis

4. Which graph shows uniform POSITIVE acceleration?

(A)	(B)
(C)	(D)
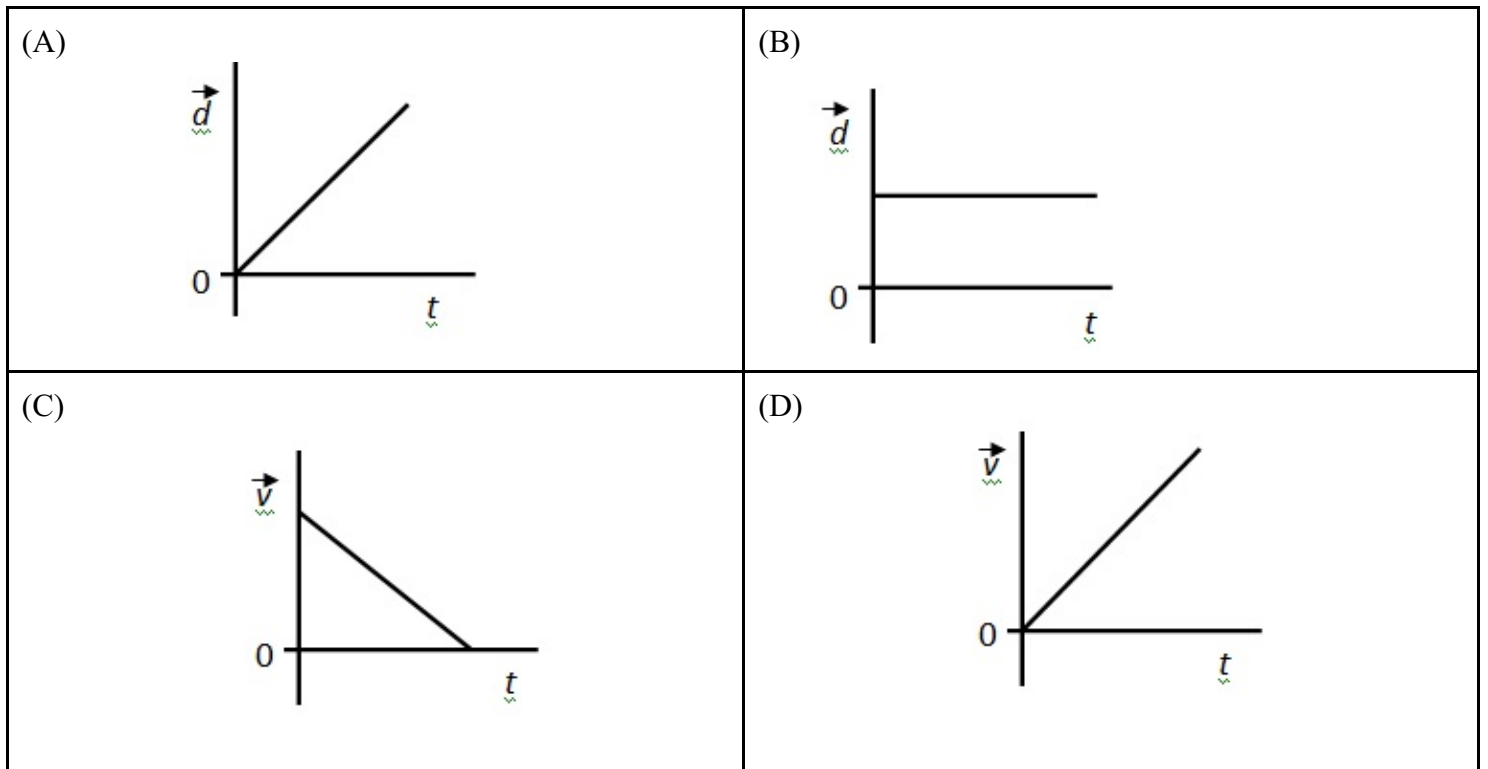
5. What does a straight line with a positive slope represent on a d-t graph?

    (A)   Constant positive acceleration.
    (B)   Constant negative acceleration.
    (C)   Constant positive velocity
    (D)   Constant negative velocity

6. What does a straight line with a negative slope represent on a d-t graph?

    (A)   Constant positive acceleration.
    (B)   Constant negative acceleration.
    (C)   Constant positive velocity
    (D)   Constant negative velocity

7. How is zero acceleration represented on a v-t graph?

    (A)   Straight line with a positive slope.
    (B)   Straight line with a negative slope.
    (C)   Straight line with zero slope.
    (D)   All are correct

8. Which motion is depicted in the graph?
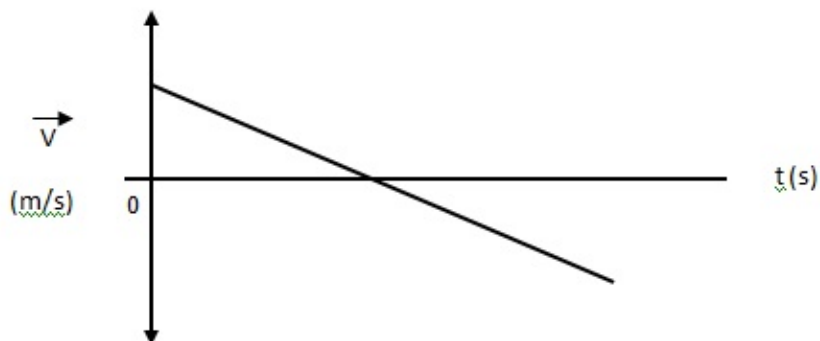
    (A)   A ball is dropped and it bounces back to its original height
    (B)   A car slows down as it approaches a stop sign
    (C)   A frog jumps up and falls back toward the ground
    (D)   A skydiver jumps from a plane

Use the graphs below to answer questions 9-10

9.   Which graph is the object slowing down as it travels to the right?

(A)   2
(B)   3
(C)   4
(D)   5

10.   Which graph does the object start to the left of the reference point and travel with uniform motion to the right?

(A)   1
(B)   2
(C)   3
(D)   4

11.   How is constant acceleration represented on a v-t graph?

(A)   Straight line with a positive slope.
(B)   Straight line with a negative slope.
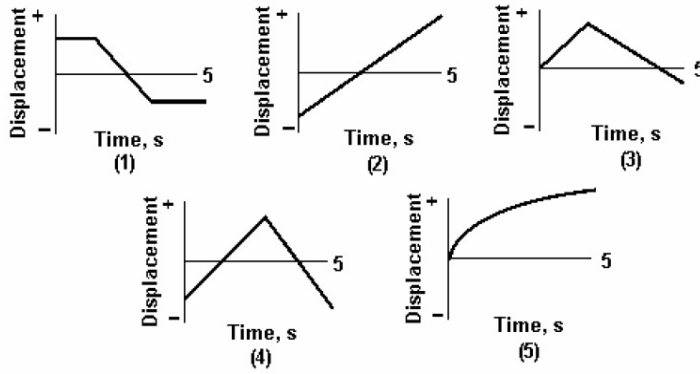(C)   Straight line with zero slope.
(D)   Either a, b, or c.

Use the graphs below to answer questions 12-13:
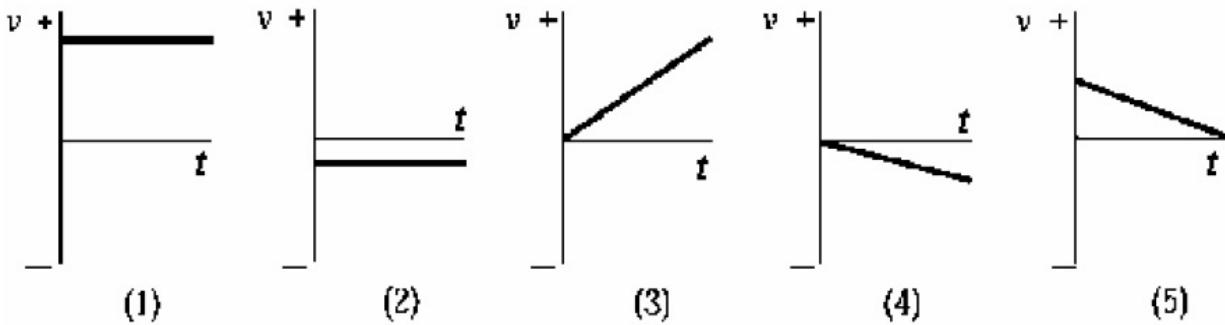
12.   Which v-t graph best describes the motion of an object whose velocity is constant and negative?

(A)   1
(B)   2
(C)   3
(D)   4

13.   In which v-t graph does the object come to a stop while travelling right?

(A)   2
(B)   3
(C)   4
(D)   5

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Use the following to answer questions 14-16:
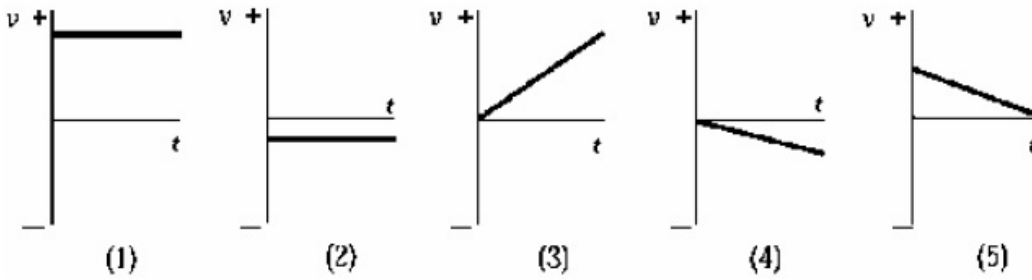
14. Which v-t best describes the motion of an object with positive velocity and negative acceleration?

(A) 2
(B) 3
(C) 4
(D) 5

15. Which v-t graph best describes the motion of an object with negative velocity and negative acceleration?

(A) 1
(B) 2
(C) 3
(D) 4

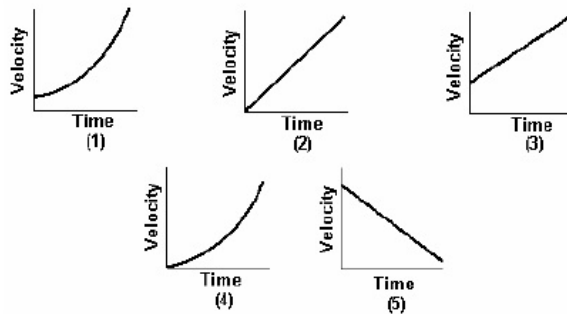16. In which v-t graph is the magnitude of the objects acceleration the greatest?

(A) 1
(B) 2
(C) 3
(D) 4

17. A car accelerates uniformly from a velocity of 10 km/h to 30 km/h in one minute. Which v-t graph best describes the motion of the car?

A) 1
B) 2
C) 3
D) 4

Use the following to answer questions 18-20:
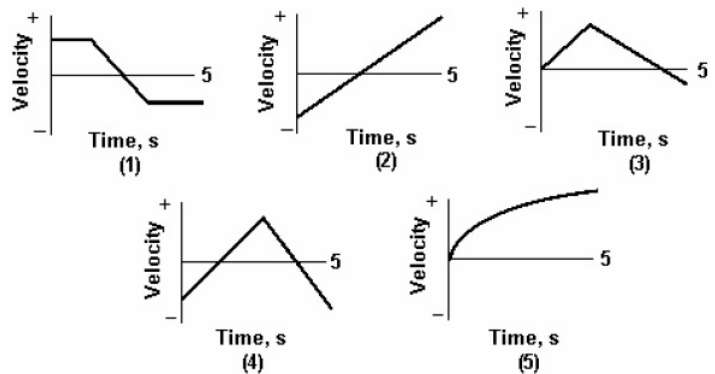
18. In which graph does the object have no acceleration at t = 5 s?

(A) 1
(B) 2
(C) 3
(D) 4

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19.   In which graph does the object have a constant acceleration for the entire 5 s?

    (A)   1
    (B)   2
    (C)   3
    (D)   4

20.   In which graph does the object never have a constant acceleration?

    (A)   2
    (B)   3
    (C)   4
    (D)   5

PART B: WRITTEN RESPONSE

1.   The distance-time graphs below represent the motion of a car. Match the descriptions with the graphs. Explain your answers.

Descriptions:

    1. The car is stopped.
    2. The car is traveling at a constant speed.
    3. The speed of the car is decreasing.
    4. The car is coming back at a constant speed.
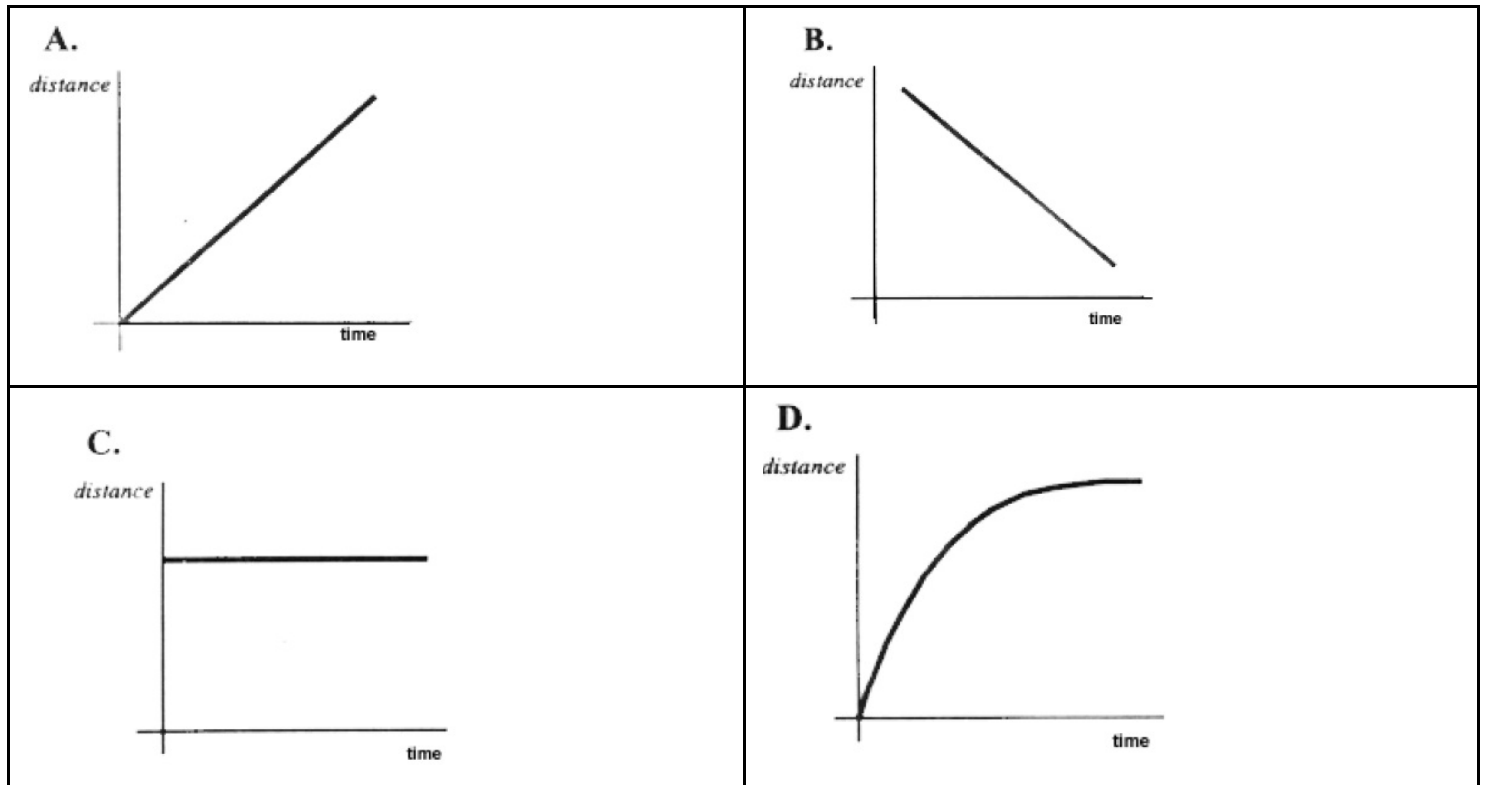
Graph A matches description _____ because _____.
Graph B matches description _____ because _____.
Graph C matches description _____ because _____.
Graph D matches description _____ because _____.

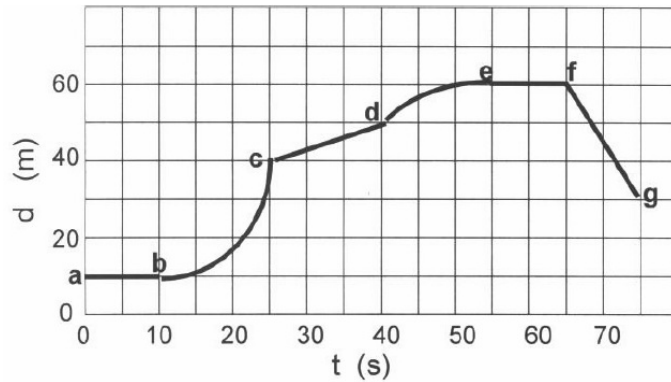2.   Use the displacement-time graph carts motion:

A.   In which section(s) is the cart accelerating? _____

B.   In which section(s) is the cart not moving? _____

C.   In which section(s) is the cart moving backwards? _____

D.   In which section(s) is the cart's instantaneous velocity at any time equal to its
average velocity? _____

E.   What is the velocity of the cart in these sections?
a-b __0 m/s_____ c-d _____ e-f _____ f-g _____

F.   How far does the cart move in section b-c? _____ e-f? _____

3.   The graph below shows how three runners ran a 100-meter race.
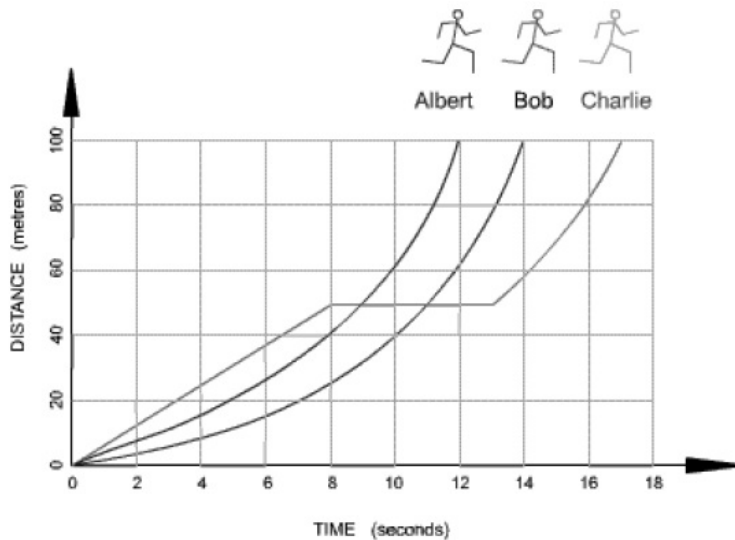
A)   Which runner won the race? Explain your answer.

B)   Which runner stopped for a rest? Explain your answer.

C)   How long was the stop? Explain your answer.

D)   How long did Bob take to complete the race? Explain your answer.

E)   Calculate Albert's average speed. (Figure the distance and the time first!)

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4. A woman walks away from a away from a starting point in a straight line. A position-time graph for her motion is shown to the right.
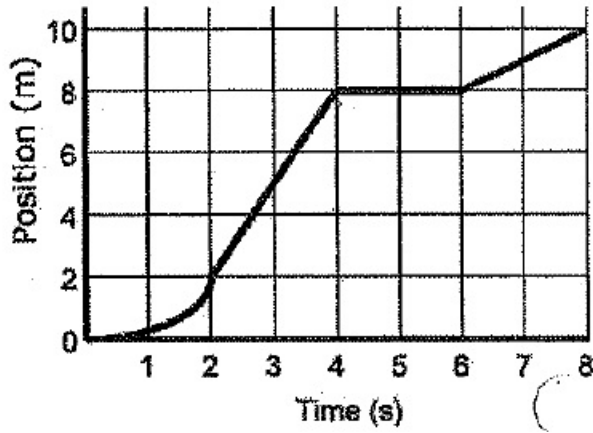
A) Describe her motion between 0s and 2 seconds:_____

B) Describe her motion between 2s and 4 seconds: _____

C) Describe her motion between 4s and 6 seconds: _____

E) Describe her motion between 6s and 8 seconds: _____

F) Complete the table below:

Time Interval	Woman Velocity
2 to 4 seconds	
2 to 6 seconds	
6 to 8 seconds	

10. The graph below is for a space capsule attached to a rocket. Describe the graph below:

_____
_____
_____
_____
_____
_____