Unit 2 Review WS

Graphs 1 + 2

1.) Velocity
2.) nothing
3.) Graph 1
an object moves away from the origin @ 1 m/s for 5 sec, then turns around and moves back @ -1 m/s for 5 sec.

4.) 2 m
5.) 3m
6.) 1 m/s
7.) -1 m/s
8.) 0 m/s^2
9.) 0 m/s^2

Graph 2
An object starts 5 m behind the origin, walks at 2 m/s toward the origin, passes the origin, and continues 5 m past the origin, then turns around and walks at -1 m/s for 5 sec back to the origin.

4.) -1 m
5.) 3m
6.) 0.5 m/s
7.) -1 m/s
8.) 0 m/s^2
9.) 0 m/s^2

Graphs 3 + 4

1.) acceleration
2.) displacement
3.) Graph 3
An object is moving 2 m/s in the negative direction for 3 sec. It slows down, stops, and speeds up in the positive direction, all with a constant acceleration of 1 m/s^2 in the positive direction, for 4 sec, then maintains a constant velocity of 2 m/s for 3 sec.

4.) -2 m/s
5.) 2 m/s

Graph 4
An object is moving in the positive direction slowing down, stops, turns around, and speeds up in the negative direction, all at a constant acceleration of -2 m/s^2, for 6 seconds. It maintains a constant speed of -6 m/s for one sec, then slows back down to rest at 10 sec

4.) 2 m/s
5.) -6 m/s

Graph 3

6.) $0\ m/s^2$

7.) $1\ m/s^2$

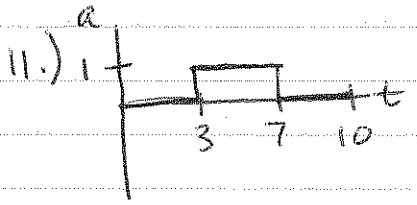
8.) $-2\ m$

9.) $2\ m$

10.) $0\ m$

Areas are equal

11.)



Graph 4

6.) $0\ m/s^2$

7.) $0\ m/s^2$

8.) $1\ m$

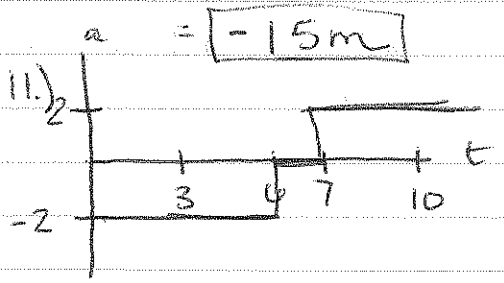
9.) $4 + \frac{1}{2}(1)(2) = -5\ m$

10.) $\frac{1}{2}(6)(3) - \frac{1}{2}(7+1)(6)$

$9 - 24$

$= \boxed{-15\ m}$

11.)



Assume that rightward motion is in the positive direction.

Velocity	Acceleration	Direction of Motion (Right or Left)	Accelerating or Decelerating
+	+	right	accelerating
+	-	right	decelerating
-	+	left	decelerating
-	-	left	accelerating

In the diagrams below, assume all carts are moving from left to right. Indicate if the motion diagram shows acceleration. If yes, indicate the direction (left or right) of the acceleration. If no, write NA.

	Acceleration: Y/N	Dir'n
a. Reason:	N	
b. Reason:	Y	R
c. Reason:	N	
d. Reason:	Y	R
e. Reason:	Y	L

In the following scenarios, indicate the direction of acceleration.

	Description of Motion	Dir'n of Acceleration
a.	A car is moving eastward along Lake Avenue and increasing its speed from 25 mph to 45 mph.	east
b.	A northbound car skids to a stop to avoid a reckless driver.	south
c.	An Olympic diver slows down after splashing into the water.	up
d.	A southward-bound free quick delivered by the opposing team is slowed down and stopped by the goalie.	north
e.	A downward falling parachutist pulls the chord and rapidly slows down.	up
f.	A rightward-moving Hot Wheels car slows to a stop.	left
g.	A falling bungee-jumper slows down as she nears the concrete sidewalk below.	up

Kinematics:

1. A rocket starts from rest and accelerates at a uniform rate of 190 m/s^2 for 2.4 seconds. What is its final velocity?
2. A car has a velocity of 15 m/s. It then accelerates at a uniform rate of 3.5 m/s^2 for the next 0.05 minutes. What distance does the car cover during this time?
3. What must be the acceleration of a train in order for it to stop from 12 m/s in a distance of .541 km?
4. When a driver hits the brakes, his car decelerates at a uniform rate of 2.0 m/s^2. His car stops in 9.0 m. How long does it take him to stop?
5. A 5.0 kg object falls from a high building. Ignoring air resistance, what will its velocity be after 6 seconds of falling?
6. What is the one property that affects how fast an object will fall? Give an example of two objects that (if dropped from the same height) will land at different times. Give an example of two objects (if dropped from the same height) that will land at the same time: → basketball + bowling ball → piece of paper + bowling ball (air resistance)
7. A hammer and a feather are dropped on the moon. Which will hit the ground first? same time!

1.) G: $a = 190\ m/s^2$, $v_i = 0\ m/s$, $t = 2.4\ sec$
U: v_f
E: $v_f = v_i + at$
S: $v_f = 0 + 190(2.4)$
$= 456\ m/s$

2.) $v_i = 15\ m/s$, $a = 3.5\ m/s^2$, $t = 0.05\ min \times \frac{60\ sec}{1\ min} = 3\ sec$
U: d
E: $x = v_i t + \frac{1}{2}at^2$
S: $x = (15)(3) + \frac{1}{2}(3.5)(3)^2$
$S: \quad 45 + 15.75$
$= 60.75\ m$

3.) $v_f = 0$, $v_i = 12$, $x = 541\ m$, $a =$
$v_f^2 = v_i^2 + 2ax$
$0 = 12^2 + 2a(541)$
$-144 = 1082a$
$a = -0.13\ m/s^2$

4.) $v_f = 0\ m/s$, $d = 9.0\ m$, $a = 2.0\ m/s^2$, t, v_i
$v_f^2 = v_i^2 + 2ax$
$0 = v_i^2 + 2(2)(9)$
$v_i = 6\ m/s$
$v_f = v_i + at$
$0 = 6 + (-2)t$
$t = 3\ sec$

5.) $v_i = 0$, $t = 6$, $a = -9.8\ m/s^2$, v_f
$v_f = v_i + at$
$= 0 + (-9.8)(6)$
$= 58.8\ m/s$