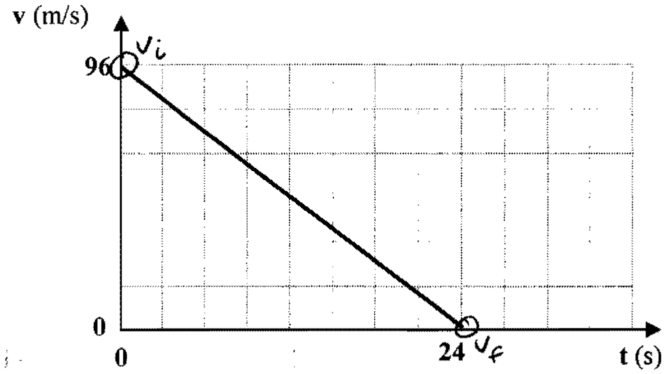
Date: ________ Pd: ____ Name: KEY

CAP Test Review

Show your work, label units, and all that good stuff.

Use the graph below in order to answer the questions that follow.



Based upon this v vs. t graph, determine the following:

1. Initial velocity, v_i: 96 m/s
2. Final velocity, v_f: 0 m/s
3. Acceleration, a: $-4\ m/s^2$
4. Displacement, Δx: 1152 m
5. Average velocity: 48 m/s

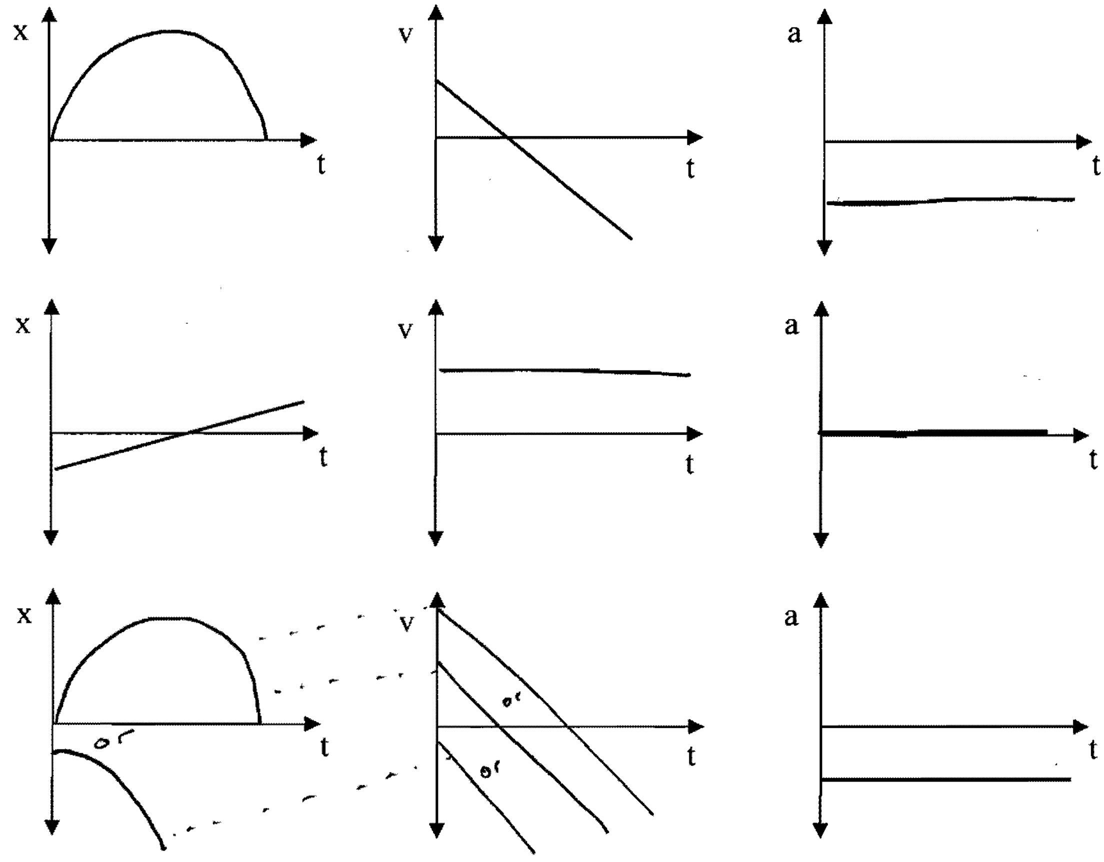
6. Specific equation: $V_f(\frac{m}{s}) = -4(m/s^2)t + 96(m/s)$

7. General equation: $V_f = at + V_i$

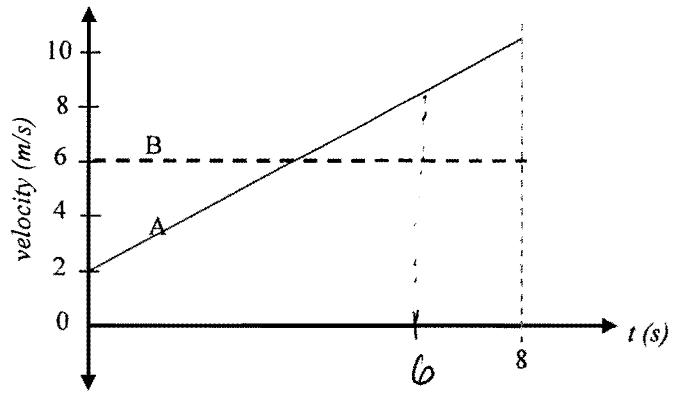
6. For the above graph, describe the objects motion (be sure to explain its speed and acceleration).
The object starts with a velocity of 96 m/s and undergoes an acceleration of $-4\ m/s^2$ (slows down) until it comes to rest at t=24 s.

7. State/explain a real-world physical situation that could represent the motion on the above graph.
More than one possible correct answer - anything that involves an object (such as a car, plane, etc) slowing down to a stop after 24 s would be ok.

8. Draw the missing graphs based on the graph you are given.



9. Compare the kinematic behavior of objects A and B as represented in the graph to the right.



	Comparison	Explain how you know.
a. Displacement from 0 to 8 s	A > B, A < B, or [✓ A = B]	$B = 6 \times 8 = 48m$ $A = (\frac{1}{2} \cdot 8 \cdot 8) + (8 \cdot 2) = 48m$
b. Velocity at t = 6 s	[✓ A > B], A < B, or A = B	A is at greater velocity
c. Acceleration at t = 6 s	[✓ A > B], A < B, or A = B	B has 0 slope so zero acceleration the whole time. A has constant positive slope, therefore constant positive acceleration.

10. The Tower of Terror ride at Disney's California Adventure Park raises high off the ground and then drops you for 3.50 seconds. Assume no friction or air resistance.

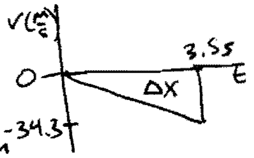
a) How fast would you be going when you hit the ground?

$V_f = at + V_i$ $\quad V_f = (-9.8\,m/s^2)(3.5s) + 0\,m/s$

$= \boxed{-34.3\,m/s}$

b) How high was the ride when it released you?

$\Delta X = \frac{1}{2}(3.5s)(-34.3\,m/s) = \boxed{-60.0m}$



or $\Delta X = \frac{1}{2}at^2 + V_i t = \frac{1}{2}(-9.8\,m/s^2)(3.5s)^2 = -60.0m$

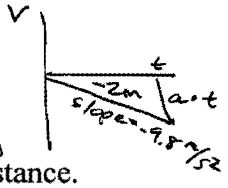
11. While in the midst of a riveting discussion of free fall, Mr. Parent drops his whiteboard marker from 2 m high.

a) How long would it take for the marker to land?

$-2m = \frac{1}{2}(t)(-9.8\,\frac{m}{s^2}t)$

$\frac{-2m}{-4.9} = \frac{-4.9\,\frac{m}{s^2}t^2}{-4.9\,m/s^2}$ $\quad \sqrt{t^2} = \sqrt{0.408}$

$\boxed{t = 0.64s}$



b) What would the marker's velocity be as it hits the ground? Assume no friction or air resistance.

$V_f = at + V_i$

$V_i = 0$

$t = 0.64s$

$a = -9.8\,m/s^2$

$V_f = (-9.8\,m/s^2)(0.64s) + 0$

$= \boxed{-6.27\,m/s}$