| Name | Period |
| :---: | :---: |
|  |  |
|  |  |
|  | Velocity WS |

[1] The conversion "rate" of Celsius temperature to Fahrenheit temperature is graphed.
a. $\qquad$ Determine the rate.
b. $\qquad$ Write the equation for this relationship.
c. $\qquad$ Calculate the Celsius temperature for a Fahrenheit temperature of $75^{\circ} \mathrm{F}$.

[2] The graph shown to the right could represent distinctly
different types of motion depending on the axes labels. Describe the motion shown if...
a. $x=$ time, $y=$ position
b. $x=$ time, $y=$ velocity
c. $\mathrm{x}=$ horizontal position, $\mathrm{y}=$ vertical position

[3] The velocity of a gerbil is shown over time.
a. $\qquad$ Calculate the average acceleration of the gerbil from $\mathrm{t}=0$ to $\mathrm{t}=6$ seconds.
b. $\qquad$ Calculate the average acceleration from $\mathrm{t}=6$ to $\mathrm{t}=10$ seconds.
c. $\qquad$ Calculate the position of the gerbil at $t=6$ seconds (assume $X_{0}$, the initial position is 30 m ).
d. Sketch a corresponding position-time graph to match this graph.
e. $\qquad$ Calculate the net displacement of the gerbil over the entire trip.
f. Can the final position of the gerbil be determined from the given information? Explain.

8. Sketch a matching acceleration-time graph for this motion.
[4] A car travels 20 km toward an observer for 30 minutes. It then turns around and moves away from the observer for 50 km in 45 minutes. Calculate:
a. $\qquad$ The displacement of the car over this time.
b. $\qquad$ The average velocity of the car over the entire trip.
c. $\qquad$ The average speed of the car over the trip.
d. Sketch a position graph of the car's motion over time and label the slope(s).
e. Sketch a velocity graph of the car's motion.
[5] Sketch a velocity-time graph for a cart rolling down a ramp with consistently increasing acceleration.
[6] A parachutist bails out and freely falls for 50 m . Then the parachute opens, and thereafter she decelerates at $2.0 \mathrm{~m} / \mathrm{s}^{2}$. She reaches the ground with a speed of $3.0 \mathrm{~m} / \mathrm{s}$.
a. $\qquad$ How long is the parachutist in the air.
b. $\qquad$ At what height does the fall begin?
[7] The position of a soccer player is shown over time. From point 0 to 3 seconds, the position of the player is given by: $x$ $=\frac{5}{2} \mathrm{mt}$ (where " m " is a positive constant). From point 3 to 7 seconds, the position of the player is given by $x=-\mathrm{mt}^{2}+\frac{15}{2} \mathrm{mt}-11 \mathrm{~m}$.
a. $\qquad$ What is the average velocity of the player from 0 to 3 seconds, in terms of $m$ ?

b. $\qquad$ Based on the motion equation, how far is the player from the observer, initially?
c. $\qquad$ Using the position equations, calculate when the soccer player reaches her furthest point from the observer, in terms of $m$.
d. Sketch a corresponding velocity-time graph for this motion. Note any relevant slopes or intercepts.
e. $\qquad$ From 0 to 7 seconds, when does the player reach the maximum velocity?
f. Describe the motion from $\mathrm{t}=3$ to 7 seconds.
9. Sketch a matching acceleration-time graph for this motion over seven seconds.
h. $\qquad$ Assume the player reaches a distance of 15 meters at $\mathrm{t}=3$ seconds. Calculate m .
[8] A stone is thrown vertically upward. On its way up, it passes a point $A$ with a speed V , and point $B, 3.00 \mathrm{~m}$ higher than $A$, with a speed $(1 / 2) \vee$. Calculate...
a. $\qquad$ the speed $V$.
b. $\qquad$ The maximum height reached by the stone above point $B$.
[9] $\qquad$ The sport with the fastest moving ball is jai alai where measured speeds have reached $303 \mathrm{~km} / \mathrm{hr}$. If a professional jai alai player faces ball at that speed and blinks, he blacks out the scene for 100 ms . How far does the ball move during his blink?

