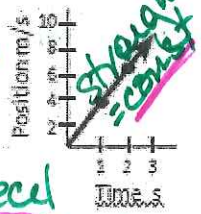
$V=\frac{\Delta d}{\Delta t}$ $a=\frac{\Delta v}{\Delta t}$ $v_f = v_i + at$ $a = \frac{v_f^2 - v_i^2}{2\Delta d}$ $a = \frac{v_f - v_i}{\Delta t}$ $\Delta d = v_i \Delta t + \frac{1}{2} a \Delta t^2$

Unit 1 & 2 Comprehensive Quiz

Name _____ Date _____ Period _____

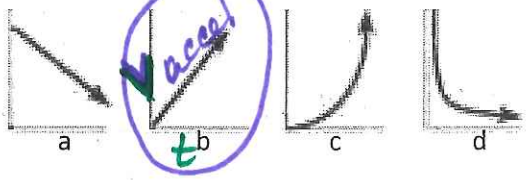
1. This is a graph of a skateboarder that is –
   Skating uphill



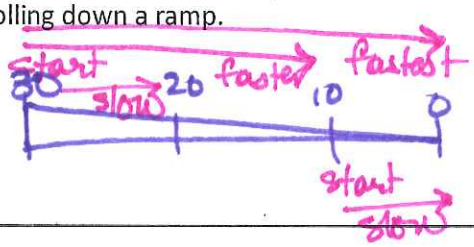
   I. Increasing velocity
   II. Speeding up
   III. Constant velocity
   IV. Increasing Speed
   V. Slowing down
   VI. Skating at a constant speed
   VII. Increasing acceleration
   VIII. Constant acceleration

   a. I, II, IV
   b. II, III, VI
   c. III, VI
   d. I, VIII

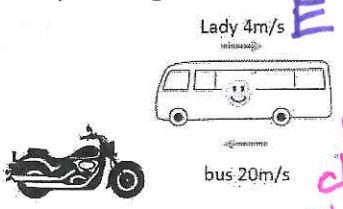
2. Which VT Graph represents a car increasing in speed?



3. Select the best description of the motion of a ball rolling down a ramp.
   a. Decreasing acceleration
   b. Constant velocity
   c. Constant speed
   d. Increasing velocity



A bus is driving west at 20 m/s. A motorcycle is waiting at a stop light. On the bus is a lady walking to her seat in the back at a speed of 4 m/s.



4. What is the Lady's speed relative to the motorcyclist?
   a. 4 m/s East
   b. 16 m/s West
   c. 20 m/s West
   d. 24 m/s West

5. What is the Lady's speed relative to the bus?
   a. 4 m/s East
   b. 16 m/s West
   c. 20 m/s West
   d. 24 m/s West

6. What is the bus's speed relative to the motorcyclist?
   a. 4 m/s East
   b. 16 m/s West
   c. 20 m/s West
   d. 24 m/s West

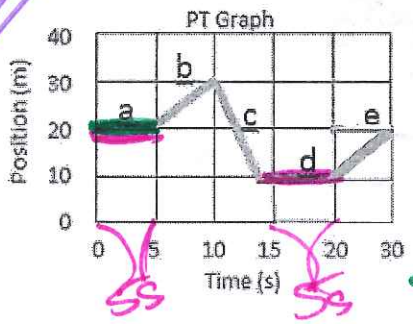
7. What is the average velocity if ,in a lab, Taylor finds that it take 9.2s to roll a ball down a 12.83m long ramp?
   a. .717m/s
   b. 363m/s
   c. 1.40m/s
   d. 118m/s

$v = \frac{\Delta d}{\Delta t} = \frac{12.83m - 0}{9.2s - 0}$

$V=\frac{\Delta d}{\Delta t}$ $a=\frac{\Delta v}{\Delta t}$ $v_f = v_i + at$ $a = \frac{v_f^2 - v_i^2}{2\Delta d}$ $a = \frac{v_f - v_i}{\Delta t}$ $\Delta d = v_i \Delta t + \frac{1}{2} a \Delta t^2$

PT

The PT graph below depicts a bicyclist's trip.



still @ 20m

8. What is the velocity and acceleration over time 0-5 seconds?

no motion V=0 a=0

a. Velocity = 20m/s Acceleration = 20m/s²
b. Velocity = 0m/s Acceleration = 20m/s²
c. Velocity = 20m/s Acceleration = 0m/s²
d. Velocity = 0m/s Acceleration = 0m/s²

9. When and how long did the bicyclist stop for a water break?

a. He was 20 meters away and stopped for less than 1 second.
b. He was 10 meters away and stopped for 5 seconds
c. He was 5 meters away and stopped for 15 seconds
d. He was 5 meters away and stopped for 5 seconds

10. Select the best description of motion

a. a and d illustrate no motion
b. a and d are both at the same distance
c. b and e illustrate upward motion
d. no backward motion is illustrated

a = 20m d = 10m never on PT VT or AT

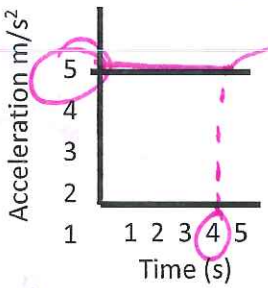
11. When bowling on the wheelchair ramp, if the ball begins at rest at the top of the ramp, what is the velocity at time = 4 seconds?

$V_i = 0$ $V_f = ?$ t

$V_f = V_0 + at$

$0 + 5\frac{m}{s^2} \cdot 4s$

$20\frac{m}{s}$



a. 0.8m/s
b. 4 m/s
c. 5 m/s
d. 20 m/s

12. What is the averages acceleration when a tank accelerates from rest to 30m/s in 6.2s?

$V_0 = 0$ V_f t $a = ?$

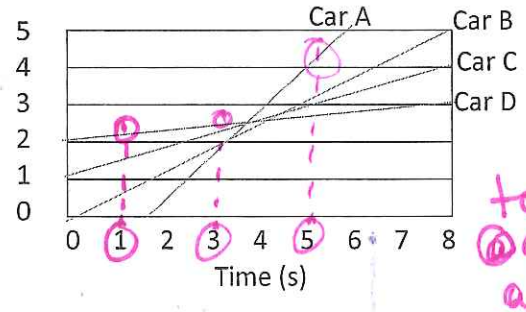
a. .207 m/s²
b. 4.84 m/s²
c. 23.8 m/s²
d. 186 m/s²

$a = \frac{V_f - V_0}{\Delta t} = \frac{30 - 0\frac{m}{s}}{6.25 - 0s}$

$V=\frac{\Delta d}{\Delta t}$ $a=\frac{\Delta v}{\Delta t}$ $v_f = v_i + at$ $a = \frac{v_f^2 - v_i^2}{2\Delta d}$ $a = \frac{v_f - v_i}{\Delta t}$ $\Delta d = v_i \Delta t + \frac{1}{2} a \Delta t^2$

Position Time

Graph of Race Cars



top @ greater distance alone ahead

13. In the distance time graph of four race cars, which object has the lead at time = 1 seconds?
    a. Car A
    b. Car B
    c. Car C
    d. Car D

14. Which race car is ahead at time = 3 second?
    a. Car A
    b. Car B
    c. Car C
    d. Car D

15. Which race car is ahead at time = 5 second?
    a. Car A
    b. Car B
    c. Car C

16. Which race car is going the fastest? steepest slope greatest dist in least time
    a. Car A
    b. Car B
    c. Car C
    d. Car D

17. Jane was going to a store 10m away. She missed her exit by 1m on the highway so she made a 1m U-Turn. What can be said about Janes displacement and distance?
    a. The total distance is 1m longer than the displacement
    b. The total distance is 1m shorter than the displacement
    c. The total distance is 2m longer than the displacement
    d. The total distance is 2m shorter than the displacement

Jane — store exit — uturn exit — 10m — 1m — 1m

distance = total traveled = 10+1+1 = 12m

displacement = final − orig = 10 − 0 = 10m

18. A plane is flying forward at 341m/s. A passenger shoots an arrow at 150m/s toward the front of the plane. From the frame of reference of the observing air traffic controller in the tower the arrow appears to move at –
    a. 150m/s
    b. 191m/s
    c. 491m/s
    d. 51150m/s

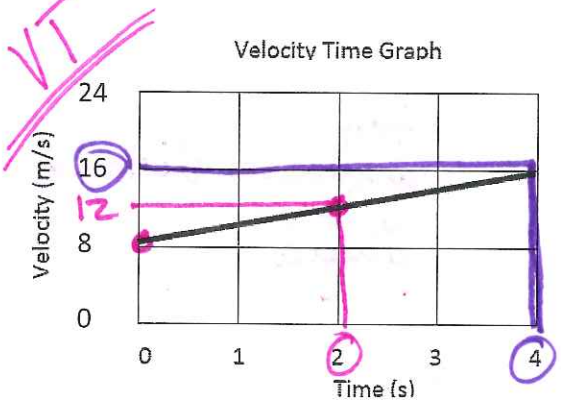
off plane — 341 — 150 — 341−150

341 m/s — 150 m/s — 150+341 = 491 m/s

like electric sidewalk

$V=\frac{\Delta d}{\Delta t}$ $a=\frac{\Delta v}{\Delta t}$ $v_f = v_i + at$ $a=\frac{v_f^2 - v_i^2}{2\Delta d}$ $a=\frac{v_f - v_i}{\Delta t}$ $\Delta d = v_i \Delta t + \frac{1}{2} a \Delta t^2$

Evaluate the jogger's acceleration as represented on this VT Graph.



19. What is the jogger's acceleration after 2 seconds of running?

a. .5 m/s²
b. 1 m/s²
c. 2 m/s²
d. 12 m/s²

$a = \frac{v_f - v_0}{t_f - t_0}$ $\frac{12-8}{2-0} = \frac{4}{2} = 2 \frac{m}{s^2}$

20. What is the jogger's acceleration after 4 seconds of running?

a. .5 m/s²
b. 2 m/s²
c. 4 m/s²
d. 16 m/s²

$a = \frac{v_f - v_0}{t_f - t_0} = \frac{16-8}{4-0} = \frac{8}{4} = 2 \frac{m}{s^2}$

21. **Free Response:** What are the similarities and differences in question 19 and 20?

Same
Const velocity (straight line)

22. **Free Response:** How long will it take a bird to fly 300 meters if it is flying with an average speed of .3m/s? Show all works in calculations to receive credit.

$t \cdot V = \frac{d}{t} \cdot t$

$t = \frac{d}{V}$ $\frac{300 m}{.3 \frac{m}{s}} = 1000 s$