NAME KEY DATE Period:

Physics Exam 1 Review

Define:

1. Velocity – How fast distance is changing over time.
   $$\frac{\Delta d}{\Delta t}$$

2. Acceleration – How fast Velocity is changing over time
   $$\frac{\Delta V}{\Delta t}$$

3. Displacement – distance. Can be Positive or negative

4. Gravity – the acceleration caused by Massive objects

Answer: $9.8 m/s^2$ on Earth

5. What is the slope of a position/time graph called?

   Velocity

6. What is the slope of a velocity/time graph called?

   Acceleration

7. What formula would you use in a situation with uniform velocity?

   $d = vt$

8. What formula would you use in a freefall?

   $d = \frac{1}{2}at^2$

9. What formula would you use in a situation with a spinning disk?

   $\theta = \omega t$

10. A standard issue German shepherd can run at a maximum velocity of 6.7m/s. How far could one run in 4.5min?

    $D = Vt$ $\longrightarrow \times 60 = 270s = t$

    $d = 6.7 m/s \cdot 270_s$

    $d = 1809 m$

11. Another, less physically abled German shepherd ran at full speed for 5min and reached a distance of 1.5km. What was its velocity? $\longrightarrow \times 60 = 300_s$

    $\longrightarrow 1500m$ $d = Vt$

    $1500 = V \cdot 300$ $V = 5 m/s$

12. Draw a position time graph of the dog in questions 7 and 8. Use two distinct lines and a legend. What are the slopes of the lines? Which is steeper?

13. Dario is driving his new Honda Trail 90 down Main Street in Taylor. From rest he can accelerate at a maximum rate of 1.6m/s². How soon will he reach 18m/s? (the speed limit on Main) $V = at$

    $18 m/s = 1.6 m/s^2 \cdot t$

    $t = 11.25_s$

14. How far will Dario have gone in that amount of time?

$d = \frac{1}{2}at^2$ $d = \frac{1}{2}(1.6\text{m/s}^2) \cdot (11.25)^2$

$d = 101.25\text{m}$

15. A record player can spin an old fashioned record at 45rot/min. convert to rot/s. ($\theta = \omega t$)

$\dfrac{45 \text{ rot}}{\text{min}} \left| \dfrac{\text{min}}{60s} \right| = 0.75 \text{ rot/s}$

16. What is the total angle of displacement if that record player plays an entire side (4min)?

$\theta = \omega t$ $\theta = 0.75 \text{ r/s} \cdot 240_s$ $\theta = 180 \text{ rot}$

$\hookrightarrow \times 60 = 240s$

17. Draw a velocity time graph illustrating the velocity of a car accelerating from a stop sign at a rate of 2m/s² to 10m/s, holds for 5s then back down to 0 at 1m/s².

Something like this

18. What is meant by the term "terminal Velocity?"

It is the Maximum speed an object can reach while in free fall

19. A rapscallion throws a penny off the top of the brand new Freedom tower. The freedom tower is 1776ft tall. If there were no wind resistance, how long would it take that penny to fall? (541.3m)

$d = \frac{1}{2}at^2$

$541.3\text{m} = \frac{1}{2} 9.8\text{m/s}^2 \cdot t^2$

$110.47 = t^2$ $10.51 = t$

20. Jacob throws a quarter off of the top of TC. The quarter leaves his hand at 4.3m/s. If TC is 7m tall, how long did it take the quarter to hit the ground? How fast was it moving?

$d = V_i t + \frac{1}{2}at^2$ $7\text{m} = 4.3\text{m/s} + \frac{1}{2} 9.8\text{m/s}^2 \cdot t^2$

$0.761 = t^2$ $t = 0.87_s$

21. Linzey rolls a matchbox car along a 2.2m table at a constant velocity of 4cm/s. how long does it take?

$d = Vt$

$2.2\text{m} = .04\text{m/s} \cdot t$

$t = 55s$

$\hookrightarrow \dfrac{4\text{cm}}{s} \left| \dfrac{1\text{m}}{100\text{cm}} \right| = .04\text{m/s}$

22. Why can you not use the formula d= ½at² on the previous question?

because Velocity is Constant. acceleration is 0

23. A commercial airliner has a maximum velocity of 232m/s. how far can it go in 3hrs?

$d = Vt$ $d = 232\text{m/s} \cdot 10,800$ $d = 2505600\text{m}$

$\hookrightarrow 3\text{hrs} \cdot 60 \cdot 60$

$10,800s$

or

$2,505.6\text{km}$