Name __Key__ per _____ due date _____ mail box _____

Acceleration = <u>(final velocity – initial velocity)</u>
change in time

1. Which of the following is not example of acceleration?
   a. A person jogging along a winding path
   (b.) A car stopped at a stop sign
   c. A cheetah that sprints toward prey
   d. A plane taking off

2. Which of the following are proper units for measuring acceleration?
   a. meters/second (m/s)
   b. pounds per square inch (lbs./in²)
   (c.) meters per second squared (m/s²)
   d. pounds per mile per minute (lbs/m/min)

True or false: If false then correct the underlined word.

1. __T__ The rate at which <u>velocity</u> changes over time is acceleration? _____

2. __T__ If velocity is <u>increasing</u>, then acceleration is positive? _____

3. __F__ If velocity is <u>increasing</u>, then acceleration is negative? _decreasing_

4. __T__ Negative acceleration is also called <u>deceleration</u>? _____

Calculate

5. Mike hikes at a speed of 1km/h but, then gradually speeds up to 5km/h over the course of 2 hours. Find acceleration:

$$A = \frac{V_F - V_I}{t}$$ $$A = \frac{5km/h - 1km/h}{2h}$$ $$A = \frac{4km/hr}{2h}$$

$$\boxed{A = 2 \, km/hr^2}$$

6. Passengers fly on an airplane which, went from 350km/hr to 650 km/hr in 30minutes time. **30min = 0.5hr** Find acceleration:

$$A = \frac{V_F - V_I}{t}$$ $$A = \frac{650 km/hr - 350 km/hr}{0.5 hr}$$ $$A = \frac{300 km/hr}{0.5 hr}$$

$$\boxed{A = 600 \, km/hr^2}$$

7. The same plane lands 5 hours later. The plane starts slowing down and descends from an altitude of 22,000ft to land safely at sea level. At the start of the descent, it was traveling at 650km/hr. It lands and taxis to a stop all in a span of 45minutes. **Find deceleration (negative answer):**

45 min ⟶ 0.75 hr

$$A = \frac{V_F - V_I}{t}$$ $$A = \frac{0 km/hr - 650 km/hr}{0.75 hr}$$

$$A = \frac{-650 km/hr}{0.75 hr}$$ $$\boxed{A = -866.\overline{6} \, km/hr^2}$$

8. A hockey player deflects and shoots a puck moving toward him at 5m/s. A half second after the slap shot, the puck is moving 15m/s toward the goal. Find acceleration:

$$A = \frac{V_F - V_I}{t} \qquad A = \frac{15m/s - 5m/s}{0.5s} \qquad \boxed{A = 20 m/s^2}$$

9. Bob and his pals rode a roller coaster that went from 120ft/s to 200ft/s in just under 3seconds. Find acceleration:

$$A = \frac{V_F - V_I}{t} \qquad A = \frac{200 ft/s - 120 ft/s}{3s}$$

$$A = 80 ft/s \Big/ 3s \qquad \boxed{A = 26.\overline{6} ft/s^2}$$

10. A car speeds along at 55mph. It must brake and slow down because of heavy traffic. The car slows to 25mph over the next 5 minutes of driving. $5_m = 0.08\overline{3}_h$ Find deceleration (negative answer):

$$A = \frac{V_F - V_I}{t} \rightarrow A = \frac{25mph - 55mph}{0.08\overline{3} hr} \qquad 5 min \xrightarrow{\div 60} 0.08\overline{3} hr$$

$$A = \frac{-30 mph}{0.08\overline{3} hr} \qquad \boxed{A = -360.01 mph^2}$$

11. The fast car goes from zero to 60mph in 8 seconds. 8sec = 0.00222hr

$$A = \frac{V_F - V_I}{t} \qquad A = \frac{60mph - 0mph}{0.00\overline{2} h} \qquad \boxed{A = 27000.27 mph^2}$$

12. What is the acceleration of a subway train that speeds up from 5m/s to 25m/s in 18 seconds between the downtown and uptown stops.

$$A = \frac{V_F - V_I}{t} \qquad A = \frac{25m/s - 5m/s}{18 sec} \qquad A = \frac{20 m/s}{18 s}$$

$$\boxed{A = 1.\overline{1} m/s^2}$$

8. A hockey player deflects and shoots a puck moving toward him at 5m/s. A half second after the slap shot, the puck is moving 15m/s toward the goal. Find acceleration:

$$A = \frac{V_F - V_I}{t} \qquad A = \frac{15m/s - 5m/s}{0.5s} \qquad \boxed{A = 20 m/s^2}$$

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10. A car speeds along at 55mph. It must brake and slow down because of heavy traffic. The car slows to 25mph over the next 5 minutes of driving. $5m = 0.083h$ Find deceleration (negative answer):

$$A = \frac{V_F - V_I}{t} \rightarrow A = \frac{25mph - 55mph}{0.08\overline{3} hr} \qquad 5 min \xrightarrow{\div 60} 0.08\overline{3} hr$$

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$$A = \frac{-30mph}{0.08\overline{3}hr} \qquad \boxed{A = -360.01mph^2}$$

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$$A = \frac{V_F - V_I}{t} \qquad A = \frac{25m/s - 5m/s}{18sec} \qquad A = \frac{20 m/s}{18s}$$

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