Formulas: $a = \frac{\Delta V}{t}$

$a = \frac{v_f - v_i}{t}$

$d = v_i t + \frac{1}{2} a t^2$

Name Key

Date

Acceleration Word Problems Practice

Answer the following questions using the proper formula and units!

1. A car is stopped at a red light. When the light turns green, the car speeds up to 80 m/s in 5 s. What is the acceleration of the car?

Formula:	Plug in numbers	Answer w/ unit:
$a = \frac{v_f - v_i}{t}$	$a = \frac{(80 m/s - 0 m/s)}{5s}$	$16 m/s^2$

2. What is the acceleration of a train that travels from 100m/s to 120m/s in 10s?

Formula:	Plug in numbers	Answer w/ unit:
$a = \frac{v_f - v_i}{t}$	$a = \frac{(120 m/s - 100 m/s)}{10s}$	$2 m/s^2$

3. A boat accelerates at a rate of 6.0 m/s^2 down the river. How much time will it take the boat to speed up to 70 m/s?

Formula:	Plug in numbers	Answer w/ unit:
$a = \frac{v_f - v_i}{t}$	$6.0 m/s^2 = \frac{(70 m/s - 0 m/s)}{t}$	$11.67 s$

4. Carlos throws a boomerang into the air with an initial velocity of 5 m/s. The boomerang takes 5 s to reach a velocity of 3 m/s. What is the boomerang's acceleration?

Formula:	Plug in numbers	Answer w/ unit:
$a = \frac{v_f - v_i}{t}$	$a = \frac{3 m/s - 5 m/s}{5s}$	$-0.4 m/s^2$

5. A gorilla falls out of the tree with an acceleration of 25 m/s^2. If she hits the ground in 5 s, what is the poor gorilla's change in velocity?

Formula:	Plug in numbers	Answer w/ unit:
$a = \frac{\Delta V}{t}$	$25 m/s^2 = \frac{\Delta V}{5s}$	$125 m/s$

Name_____

Date_____

6. A roller coaster is moving at 25 m/s at the bottom of a hill. 2.5 s later the roller coaster is at the top of the hill traveling 10 m/s. What is the acceleration of the roller coaster?

Formula:	Plug in numbers	Answer w/ unit:
$a = \frac{v_f - v_i}{t}$	$a = \frac{10\ m/s - 25\ m/s}{2.5\ s}$	$-6\ m/s^2$

7. An apple falls from a tree and reaches the ground in 4seconds with a velocity of 40m/s. What is the acceleration?

Formula:	Plug in numbers	Answer w/ unit:
$a = \frac{v_f - v_i}{t}$	$a = \frac{40\ m/s - 0\ m/s}{4\ s}$	$10\ m/s^2$

8. A wrecking ball suspended from a crane breaks loose and falls to the ground with an acceleration of 10 m/s^2. It hits the ground with a velocity of 30m/s. How long did it take to hit the ground?

Formula:	Plug in numbers	Answer w/ unit:
$a = \frac{v_f - v_i}{t}$	$10\ m/s^2 = \frac{(30\ m/s - 0\ m/s)}{t}$	3 s

9. A runner accelerates from the starting line in the 100m dash at a rate of 6.0m/s^2 and reaches a velocity of 10.9m/s. How long did this runner accelerate?

Formula:	Plug in numbers	Answer w/ unit:
$a = \frac{\Delta V}{t}$	$6.0\ m/s^2 = \frac{10.9\ m/s}{t}$	1.82 s

10. A subway train pulls away from the station and begins moving towards its next stop with an acceleration of 8m/s^2. What is the change in the subway train's velocity during the first 10 sec of the its trip?

Formula:	Plug in numbers	Answer w/ unit:
$a = \frac{\Delta V}{t}$	$8\ m/s^2 = \frac{\Delta V}{10\ s}$	$80\ m/s$

***11. A cheetah travels a distance of 50 miles in 1.5 hours. If the cheetah runs with an acceleration of 2 miles/hr^2, and reaches a final velocity of 60 mi/hr, what is the cheetah's initial velocity?

$d = v_i t + \frac{1}{2} a t^2$

$50\ m = v_i (1.5\ hr) + \frac{1}{2}(2\ mi/hr^2)(1.5\ hr)^2$

$v_i = 31.8\ mi/hr$