Name ______________________________ Period __________ Date __________

Chapter 1 Linear Motion

Example Problems

1.3 Acceleration

E1. A monkey-mobile (car) accelerates from 0 mph to 60 mph (0 m/s - 26.82 m/s) in 6.71 seconds. Calculate the magnitude of the vehicles acceleration.

Record all givens, draw a picture, arrow all vectors, write the formula, substitute and solve

a =

Δv =

t =

a) ________________ ← units

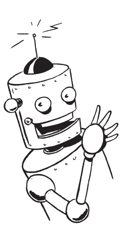
E2. The greatest launch acceleration for a roller coaster is the Dodonpa located in Japan. If the Dodonpa can change velocity from 0 mph to 107 mph (0 m/s - 47.83 m/s) in 1.8 seconds, what is the magnitude of the roller coaster's acceleration of the in m/s^2?

Record all givens, draw a picture, arrow all vectors, write the formula, substitute and solve

a =

Δv =

t =



a) ________________ ← units

Name ____ Period ___________ Date ____________

Chapter 1 Linear Motion

E3. A monkey is riding his bike when he starts pedaling harder and accelerates uniformly at 2.6 m/s² for 3.2 seconds. Calculate the change in velocity during this time period.

Record all givens, draw a picture, arrow all vectors, write the formula, substitute and solve

a =

Δv =

t =

a) ____________________ ← units

E4. A monkey is riding his bike when he slams on the brakes decelerating uniformly at 3.5 m/s² for 2.3 seconds. Calculate the change in velocity during this time period.

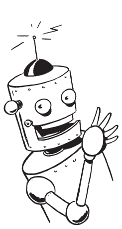
Record all givens, draw a picture, arrow all vectors, write the formula, substitute and solve

a =

Δv =

t =

a) ____________________ ← units



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E5. A monkey is playing miniature golf. The monkey hits his golf ball towards the hole on a slight up hill grade. If the ball starts with a speed of 2.0 m/s and then slows to 1.36 m/s in 2 seconds, what was the magnitude of the golf ball's acceleration?

Record all givens, draw a picture, arrow all vectors, write the formula, substitute and solve

a =

v_o =

v_f =

t =

a) ________________ ← units

E6. A monkey-mobile starts from rest and accelerates at a constant 5.5 m/s², how long will it take the vehicle to reach a velocity of 28 m/s?

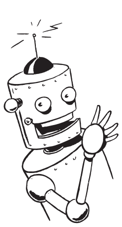
Record all givens, draw a picture, arrow all vectors, write the formula, substitute and solve

a =

v_o =

v_f =

t =



a) ________________ ← units

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Chapter 1 Linear Motion

E7. A car slows at a constant rate of 2.1 m/s², how long will it take for the car to slow from 22 m/s to a final velocity of 3.0 m/s?

Record all givens, draw a picture, arrow all vectors, write the formula, substitute and solve

a =

v_o =

v_f =

t =

a) ________________ ← units

E8. A monkey has stalled his monkey-mobile on a hill. The car has started rolling backwards down the hill with a speed of -3.0 m/s. Suddenly, he gets it going again and begins accelerating up the hill. After 2.5 seconds, the car is moving uphill at a speed of 4.5 m/s. Calculate the car's average acceleration during the entire event.

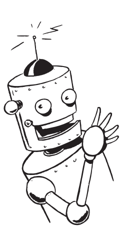
Record all givens, draw a picture, arrow all vectors, write the formula, substitute and solve

a =

v_o =

v_f =

t =



a) ________________ ← units

Name ______________________________ Period __________ Date __________

Student Problems

1.3 Acceleration

1. A monkey has a bit of a heavy foot on the gas pedal. As soon as the light turns green the monkey pushes the gas pedal to the floor and accelerates from 0 mph to 60 mph (0 m/s - 26.82 m/s) in 4.2 seconds, calculate the car's acceleration.

Record all givens, draw a picture, arrow all vectors, write the formula, substitute and solve

a =

Δv =

t =

a) ____________________ ← units

2. A monkey is teeing off on the final hole at Augusta National Golf Course. The ball is at rest on the tee. After the club makes contact with the golf ball, the ball flies off the tee at a velocity of 91.71 mph (41 m/s). If the club is in contact with the ball for 0.013 seconds, calculate the magnitude of the balls acceleration in m/s².

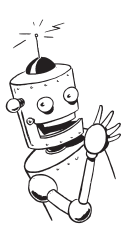
Record all givens, draw a picture, arrow all vectors, write the formula, substitute and solve

a =

Δv =

t =

a) ____________________ ← units



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3. A fully loaded jet accelerates at 2.61 m/s² down the runway for take off. It takes the jet 36 seconds to reach the take off velocity, calculate the jet's take off velocity in meters per second and miles per hour. (1 m/s is equal to 2.23694 mph)

Record all givens, draw a picture, arrow all vectors, write the formula, substitute and solve

a =

Δv =

t =

a) ______________ ← units b) ______________ ← units

4. A monkey-mobile (car) is traveling at 24 m/s when the monkey stomps on the accelerator for 3 seconds doubling the car's velocity, calculate the car's acceleration.

Record all givens, draw a picture, arrow all vectors, write the formula, substitute and solve

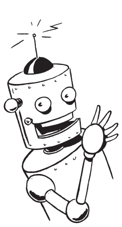
a =

v_o =

v_f =

t =

a) ______________ ← units



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5. A monkey-mobile, driven by a monkey, is traveling at a velocity of 24.59 m/s when he sees a gorilla crossing in the middle of the road and slams on the brakes. It takes the car 4.2 seconds to come to rest, calculate the magnitude of the car's acceleration?

Record all givens, draw a picture, arrow all vectors, write the formula, substitute and solve

a =

v_o =

v_f =

t =

a) ____________________ ← units

6. A monkey-mobile is traveling at 26.82 m/s when the monkey takes his foot off the gas and coast for 4.5 seconds; this causes the vehicle to slow down to a new speed of 18.7 m/s. Calculate the magnitude of the vehicle's acceleration.

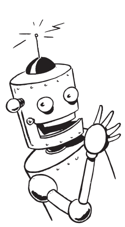
Record all givens, draw a picture, arrow all vectors, write the formula, substitute and solve

a =

v_o =

v_f =

t =



a) ____________________ ← units

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7. The head of a rattlesnake can accelerate at 50 m/s² as it strikes it's victim. If a car had the same acceleration as a rattlesnake, how much time would it take for the car to go from 0 mph to 60 mph (0-26.82 m/s)?

Record all givens, draw a picture, arrow all vectors, write the formula, substitute and solve

a =

v_o =

v_f =

t =

a) ____________________ ← units

8. On a dry road a car with good tires can slow down at a maximum rate of 4.92 m/s². How long would it take a car, initially traveling at 24.6 m/s, to come to rest?

Record all givens, draw a picture, arrow all vectors, write the formula, substitute and solve

a =

v_o =

v_f =

t =

a) ____________________ ← units