Acceleration of an Object

**Station 1**

An object rolls down a ramp. The speed of the object is \_\_\_\_\_\_ m/s at point P and the speed of the object is\_\_\_\_\_\_ m/s at point Q. The object takes \_\_\_\_\_\_ seconds to move from P to Q. What was the acceleration of the object between points P and Q?

**Station 2**

An object slides up a ramp from point P to point Q. The speed of the object at point P is \_\_\_\_\_\_ m/s.

Points P and Q are \_\_\_\_\_\_ meters apart and the object takes \_\_\_\_\_\_ seconds to move from P to Q.

What was the acceleration of the object between points P and Q?

**Station 3**

A ball rolls from rest down an inclined tube. The ball has a speed of \_\_\_\_\_\_ m/s after the ball has

rolled \_\_\_\_\_\_ meters down the tube. What was the acceleration of the ball as it rolled down the tube?

**Station 4**

A ball falls through a vertical tube passing through point P then point Q. The distance between points P and Q is \_\_\_\_\_\_ meters. The speed of the object at point P is \_\_\_\_\_\_ m/s and the speed at point Q is \_\_\_\_\_\_ m/s.

What was the acceleration of the ball as it fell through the tube?

**Station 5**

A ball rolls up a ramp a distance of \_\_\_\_\_\_ meters. The ball takes \_\_\_\_\_\_ seconds to roll this distance.

What was the acceleration of the ball as it rolled up the ramp?

**Station 6**

A cart starts rolling up an inclined ramp. The cart has a speed of \_\_\_\_\_\_ m/s when it passes through point P. The cart rolls up the ramp and then back down. The cart has a speed of \_\_\_\_\_\_ m/s when it passes through point P a second time. The cart takes \_\_\_\_\_\_ seconds to go from P on its way up the ramp to point P on its way down the ramp. What was the acceleration of the cart as it rolled along the ramp? **Solve this problem three times using three different equations for accelerated motion.**

Calculations – acceleration of an object

1. **system** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **sketch of situation**

**reference point is** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**positive direction is** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**FROM:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **TO:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**V0 = equation(s):**

**Vf = substitution:**

**a = calculations & answer:**

**t =**

**ΔX =**

2. **system** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **sketch of situation**

**reference point is** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**positive direction is** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**FROM:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **TO:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**V0 = equation(s):**

**Vf = substitution:**

**a = calculations & answer:**

**t =**

**ΔX =**

3. **system** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **sketch of situation**

**reference point is** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**positive direction is** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**FROM:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **TO:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**V0 = equation(s):**

**Vf = substitution:**

**a = calculations & answer:**

**t =**

**ΔX =**

Calculations – acceleration of an object

4. **system** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **sketch of situation**

**reference point is** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**positive direction is** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**FROM:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **TO:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**V0 = equation(s):**

**Vf = substitution:**

**a = calculations & answer:**

**t =**

**ΔX =**

5. **system** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **sketch of situation**

**reference point is** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**positive direction is** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**FROM:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **TO:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**V0 = equation(s):**

**Vf = substitution:**

**a = calculations & answer:**

**t =**

**ΔX =**

6. **system** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **sketch of situation**

**reference point is** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**positive direction is** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**FROM:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **TO:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**V0 = equation(s):**

**Vf = substitution:**

**a = calculations & answer:**

**t =**

**ΔX =**