Answer the following and submit to your instructor. Be sure to show all work.

**Part 1: Acceleration calculations**

1. A roller coaster car uniformly picks up speed as it rolls down a slope. As it starts down the slope, its speed is 4 m/s. But 3 seconds later, at the bottom of the slope, its speed is 22 m/s. What is its acceleration?
2. A cyclist accelerates from 0 m/s to 8 m/s in 3 seconds. What is his acceleration? Is this acceleration higher than that of a car which accelerates from 0 to 30 m/s in 8 seconds?
3. A car advertisement states that a certain car can accelerate from rest to 70 km/h in 7 seconds. Find the car’s acceleration. Answer in units of m/s2
4. A lizard accelerates from 2 m/s to 10 m/s in 4 seconds. What is the lizard’s average acceleration?
5. If a Ferrari, with an initial velocity of 10 m/s, accelerates at a rate of 7 m/s2 for 3 seconds, what will be its final velocity?
6. A speedboat initially moving at 15 m/s slows down to a stop with an acceleration of -1.5 m/s2. How much time passes during this change in velocity?
7. In order to catch a speeding motorist, a police officer must accelerate to +35 m/s.  The police office accelerates at a rate of +2.5 m/s for 8.0 seconds to reach this velocity.  What was the officer's initial velocity?

**Part 2: Acceleration on motion graphs**

For each graph, pick the label for the vertical axis that would make it match the given description.

1. Standing Still
   1. Position
   2. Velocity
   3. Acceleration
2. Negative acceleration
3. Position
4. Velocity
5. Acceleration
6. Constant negative velocity
7. Position
8. Velocity
9. Acceleration
10. Positive acceleration
11. Position
12. Velocity
13. Acceleration
14. Constant Positive Velocity
15. Position
16. Velocity
17. Acceleration
18. Negative velocity
19. Position
20. Velocity
21. Acceleration