12. The acceleration is constantly increasing.

13. A. Equal (to 120km/h). This is because the balls flight path is a parabola, and the peak is the AOS (axis of symmetry) so therefore, the balls speed will remain the same.
13. B. It would be smaller than 120km/h (with air resistance). This is because when you throw the ball up, the air wants to push it back down to slow the increase in height. When going down, the air pushes the ball back up, therefore it will take a longer time for the ball to reach 120km/h. In this example, we don't have the extra time, so it will be less than 120km/h when the catcher catches it.

14. A. The velocity at the peak is 0.0 m/s. The acceleration at the peak is -9.8m/s^2
14. B. 14.7m/s. This is because using v = v0 + at, and since t = 1.5 (its half because we only want to see it till the peak) and a = -9.8m/s^2 (acceleration), v = 0 (at the peak). If we solve for initial velocity we get 14.7m/s
14. C. 11.025 meters. This answer was achieved by using x = x0 + v0 + t + 1/2 at. We know v0 = 14.7m/s, t = 1.5 (we are trying to solve for the peak) a = -9.8m/s^2. x0 is 0. We get 11.025.

15. The time it takes for the package to reach the ground is ~5.61 seconds. Using x = x0 + v0 * t + at^2/2, we know that x = 0 (final position is on the ground and therefore is 0), x0 is 125m (the helicopter is 125m in the air at the time of the drop), v0 is 5.2m/s^2, a is -9.8m/s^2. Solving for t, we get ~5.61 seconds.
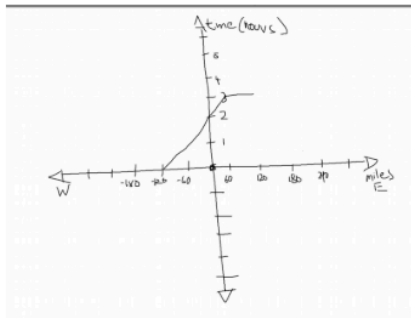
16. A. D
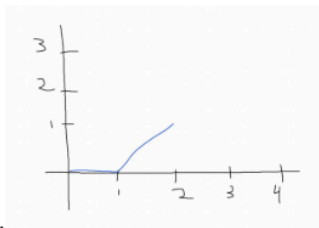16. B. Not enough information was provided to determine left
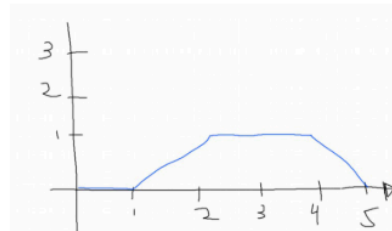16. C. B, C
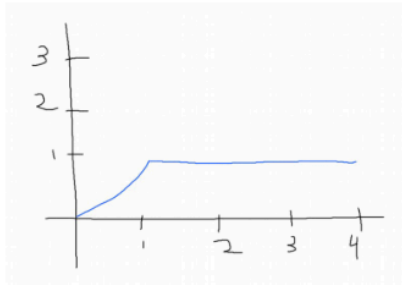16. D. A, D, E
16. E. B

17.

18. A.

18. B.

18. C.
19. A. Yes. Its moving in the positive direction
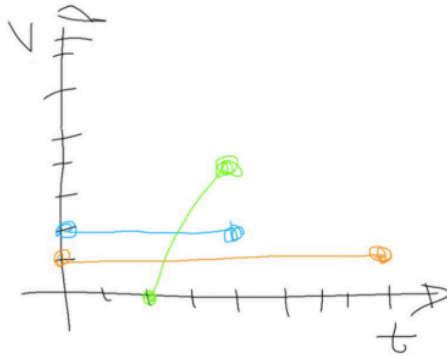19. B. No. The object is at a constant velocity - it's accereration is not changing. The graph line is going up

20. A. Yes. It's moving in the positive direction
20. B. Yes. The object is accelerating (change in velocity) in a negative direction. The graph line is going up.
20. C. 3 m/s

21. A. Yes. At 5 Seconds. The line goes positive.
21. B. Yes. At 2, 8. Those are the x intercepts

22.

In the picture above, blue represents car A, the yellowish color represents car B, and the green represents car C