NAME: DATE: Period:

CBA II Review

1. Draw a free body diagram of Hershel, the nub-tailed squirrel pulling a pecan out of the ground. The angle in which he is pulling is 23° and with a force of 3.1N.

2. Two rabid dogs are fighting over an old ham sandwich. They are both pulling on the sandwich with a force of 12N. Draw this FBD.

3. Currently the fastest car in the world, the Porsche 918 Spyder can accelerate to 60mph (26.82m/s) in 2.2 seconds. The mass of the car is 1640kg. What is the maximum force exerted by the car?

4. The 918 can also brake well, too. It can slow from 26.82m/s to 0m/s in 28.6m. What is the deceleration?

5. An airbus A-380 takes off from John Wayne International Airport at 212m/s. The liftoff angle is 17°. What are the horizontal and vertical components of this vector?

6. Describe all three of Newton's laws of motion. What do they mean in real life?

7. What is a frictional coefficient?

8. What is the μ_s of a skidding car with a mass of 1350kg and a lateral acceleration of 2.7m/s?

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9. Which law of motion postulates the formula F=ma?

10. Why is Mass different from Weight?

11. If Jailene rolls down a tall hill (30m) in 15s, how fast was she rolling?

12. Isaac wins the lottery and decides to go all Dukes of Hazard with his brand new Dodge Charger hellcat over the Taylor train bridge. If his upward velocity is 34m/s at an angle of 40°, what are the horizontal and vertical components of his jump? Draw this.

13. On the previous problem, calculate the angle at which Isaac takes the next jump if his horizontal velocity is 14m/s and his vertical velocity is 27m/s.

14. A snail accelerates from 2cm/min to 4cm/min over 4 min. What is the acceleration?

15. Ray is on an airliner headed toward New Orleans at a blistering 217m/s. If he walks toward the back of the plane at 4m/s, what is his velocity relative to the ground?

16. What is a resultant? When would you use one?

17. Two small planetismals are floating in deep space. Plantismal A is 3.62×10^{9}kg and Plantismal B is 9.34×10^{5}kg. They are separated by 10.4km. What is the gravitational force between them?

18. On a gravitation question like the previous, what would happen to the force if we reduced the distance by half? Show me this mathematically.