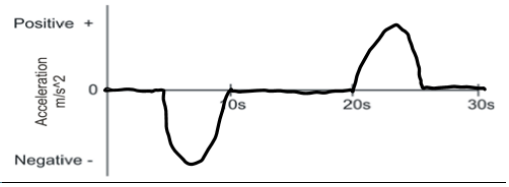
25-26 Physics 200 Final Exam Review

Answer Key – with links to video explanations

Unit 1 Test: Motion in 1 Dimension

1. Moving leftward and slowing down. Or moving downward and slowing down.
2. Moving leftward and speeding up. Or moving downward and speeding up.

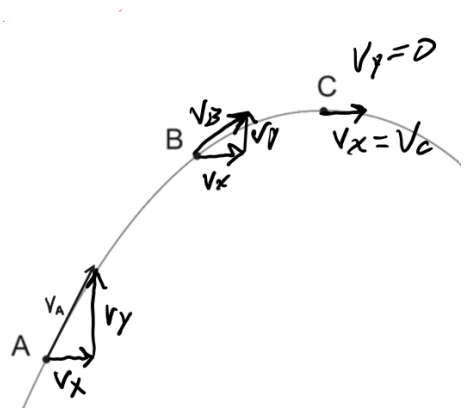
6. E 7. K 8. G 9. A

12. 

Problems:

2. 32m/s
3. 13.6s
4. 2.22m
5. 276m

Unit 2 Test: Unit 2 Test: Motion in 2 Dimension



1-3.

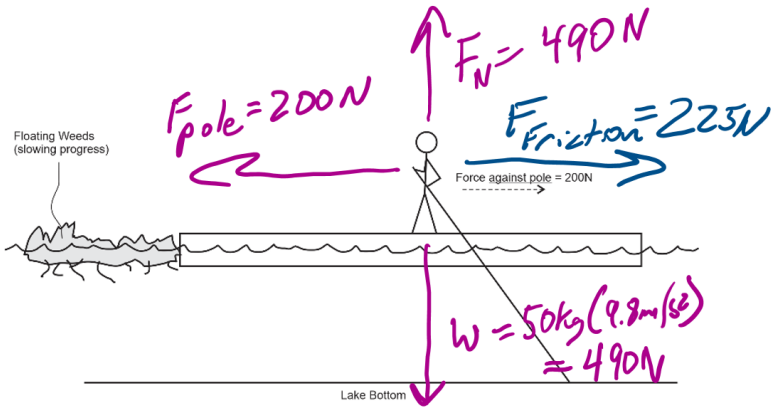
5. D [for some reason, 5 and 6 are switched in the video]
6. B [for some reason, 5 and 6 are switched in the video]

Problems:

3a. 4.9m 3b. 3m/s

5a. 13.3s 5b. 110m/s 5c. 74.7 degrees 5d. Around 600m – 610m (depending on your method and your rounding intermediate steps)

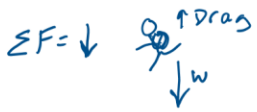
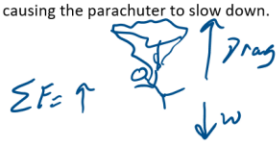
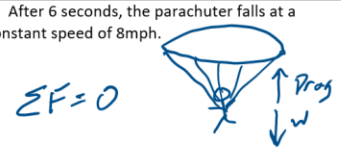
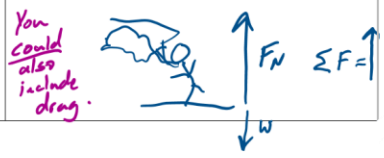
Unit 3 Test: Forces / Newton's Laws



1. $\Sigma F = 50kg\,(0.5m/s^2) = 25N$

3. Action: The person's foot pushes the ground to the right. Reaction: The ground pushes the person's foot to the left.

4.

Stages A-E. 	A. Time = 0; the parachuter has stepped out of the helicopter but has not gained any speed; parachuter speed = 0mph. 
B. Between 0s and 5s. Parachuter is falling, and his/her falling speed is increasing. 	C. Between 5s and 6s. Chute has deployed, causing the parachuter to slow down. 
D. After 6 seconds, the parachuter falls at a constant speed of 8mph. 	E. The parachuter has just touched the ground and is in the process of slowing down (before coming to a full stop). 

Problems:

1. 81.6kg

2a. 45N 2b. 58.8N Leftward 2c. 58.8N Rightward

3a. $0.875m/s^2$ 3b. 71.9N

Unit 5 Test: Circular Motion and Gravity

1a. 8.7N 1b. 12.6N

3. This needs to be updated. An orbital radius of 35,000m is less than the radius of the Earth. At that radius, the force is 2.11x107N. I meant to make the radius 35,000km, which makes the force of attraction 21.1N, which is more reasonable.

Unit 6 Test: Energy and Work

1. 60J

3a. 90,000J 3b. 90,000J 3c. 20m/s

6a. 117,600J 6b. 117,600J 6c. 45,000J 6d. 29m 6e. 30,000N

Unit 7 Test: Momentum and Impulse

2a. 3.6Ns 2b. 9m/s

3. 3.2m/s

Unit 8 Test: Rotational Motion

1a. 62.8 rad/s 1b. 0.44m/s 1c. 44.9rad/s^2

2a. 20rad/s^2 2b. 0.072Nm 2c. 0.0036kgm^2

Unit 9 Test: Electric Charges and Electric Field

1. B 3. C 6. A

15. A 16. C

Problems:

1. Originally, this involved a cat. Answer is 1.49 x 10^{-8}C 3. Pan's Charge = 2.94x10^{-3}C, Field direction is downward, because a positive charge would be attracted (downward) to the negative Van d Graaff generator.

Unit 10 Test: Electric Circuits

1.D 2. F 3. G 4. G 6. E 7. A 8. C 9. F 10. D

11. B 12. A 13. F 14. C 15. E

Problem 5:

	V	I	R	P
Total	50	3.18	15.7	159
R_1	31.8	3.18	10	101
R_2	18.2	1.82	10	33
R_3	18.2	0.91	20	16.5
R_4	18.2	0.46	40	8.2