Chapter 2 :

20- (a) 6.50 s (b) 45.7 m/s.

33- 1.52 s

66- 4.9 m/s

Chapter 3 :

14- (a) 0.819m (b) 32.5°

17- (a) 22.2m (b) 9.66m

18- (a) -236 (b) $\mathbf{1.04 * 10^3 k}$ (c) θ *not defined*, $\phi = 0$ (d) 90°

(e) -1.91**i**+10.8**j**+3.00**k** (f) $\phi = 74.7°$

Chapter 4 :

7- (a) v_0 = 303 m/s for x = 9400 m, y = –2600 m, and θ_0 = 60°

(b) 62.1s

(c) We expect the air to provide resistance but no appreciable lift to the rock, so we would need a greater launching speed to reach the same target.

30- (a) 54.2° (b) 8.96m (c) 7.96m/s

31- 27ft/s

35- (a) 17.9m/s (b) 21m/s

41- (a) $2.06 * 10^3 m$ (b) -**i**

66- (a) 7.85m/s^2 (b) 5.00m/s^2

Chapter 5 :

10- (a) 0.582m/s^3 (b) 0.773m/s^3 (c) 7.50s

12- 80N

13- (a) 1.7N (b) 3.3N (c) X

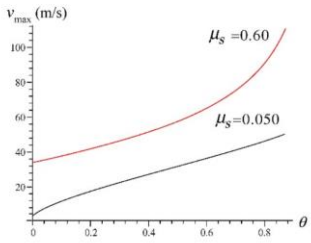
16- (a) 7.5m/s (b) +x

36- (a) 823N (b) 1.44kN

51- 22.3N

Chapter 6 :

35- (a) $$v_{\max} = \sqrt{Rg\tan(\theta + \tan^{-1}\mu_s)} = \sqrt{\frac{Rg(\tan\theta + \mu_s)}{1 - \mu_s\tan\theta}}$$



(b)

(c) 41.3m/s (d) 21.2m/s

36- (a) $2.4 * 10^5 N$ (b) $\theta = 1.2°$

48- (a) $1.1 * 10^2 N$ (b) 3.1m/s^2

57- (a) -2.7m/s^2 (b)-2.0m/s^2

59- $a = g(\sin\theta - \sqrt{2}\mu_k \cos\theta)$

62- (a) 69.7m/s (b) $dv_t = -\left(2.49 * 10^2 \frac{m}{s}\right) dC$

Chapter 7 :

9- (a) 508N (b) 0 (c) -869J (d) 0 (e) 869J

(f) Since F does not have constant magnitude, we cannot expect Eq. 7-8 to apply.

10- $1.6 * 10^2 W$

14- (a) 6.89J (b) 2.62m/s

18- -42J

24- (a) 0.706J (b) -4.05J (c) 4.88m/s (d) 40.6cm

40- (a) 5.70m/s (b) 52.0J (c) 0 (d) 0 (e) 0.283m

Chapter 8 :

2- (a) 14.8m/s (b) 12.6m/s

(c) We conclude that the block stops before passing out of the “rough” region

9- 30cm

10- (a) 10m (b) 49N (c) 4.1m (d) $1.2 * 10^2 N$

21- (a) 4.93J (b) 3.29J (c) 0.477m

51- (a) $1.268 * 10^4 J$ (b) 13kW

75- 12m

Chapter 9 :

24- 3.2m

39- (a) 6.9m/s (b) 30° counterclockwise from the +x axis (c) 6.9m/s

(d) −30° counterclockwise from the +x axis (e) 2.0m/s (f) -180°

49- 3.0m

52- (a) 50kg/s (b) $1.6 * 10^2 kg/s$

53- (a) downward (b) 0.50m/s (c) 0

59- (a)2.7m/s (b) X

Chapter 10 :

10- $5.2 * 10^{-4} kg * m^2$

14- 0.054kg*m^2

20- (a) $5.5 * 10^{15} s$ (b) 26

24- 1.6kg*m^2

41- (a) 1.57m/s^2 (b) 4.55N (c) 4.94N

56- 4.39rad/s

Chapter 11 :

20- (a) 0.21 rev/s
(b) The direction of the precession is clockwise as viewed from overhead.

22- 0.081rad/s

44- (a) 2.4m/s^2 (b) 24rad/s^2 (c) 6.0N **i**

46- 49.5J

55- 0.42

58- (a) 1.6kg*m^2 (b) 0.826rad/s

Chapter 12

2- 71.7N

8- (a) L/2 (b) L/4 (c) L/6 (d) L/8 (e) 25L/24

13- 7.04N

22- (a) 2mg (b) mg (c) mg (d) $\sqrt{2}mg$

23- (a) 95N (b) 54N

33- (a) 46.6° (b) 74.2kg (c) 14.8kg

45- (a) $1.38 * 10^3 N$ (b) 180N

50- (a) 35N **i**+200N **j** (b) -45N **i**+200N **j** (c) $1.9 * 10^2 N$