

# ***FORCES, CIRCULAR MOTION, AND GRAVITY***

## **Chapter 4-5 Assignments and Answers**

### ***ASSIGNMENTS:***

#### **Ch. 4 Startup Assignment:**

HW due: \_\_\_\_\_

Read and take notes on textbook Sections 4.1-4.6 (stop after/Pg. 81)

Work textbook pg. 98-99 Problems #1-3, 7, 9, 24

#### **Ch. 4 During-Chapter Assignment Pt. 1:**

HW due: \_\_\_\_\_

Work textbook pg. 98-101 Problems #5, 10, 15, 16, 22, 23, 25, 27, 31-35

#### **Ch. 4 During-Chapter Assignment Pt. 2:**

HW due: \_\_\_\_\_

Work textbook pg. 98-105 Problems

#36, 41, 47, 52, 56, 60, 64a, 72, 75, 76, 83

#### **Ch. 5 During-Chapter Assignment:**

HW due: \_\_\_\_\_

Work textbook pg. 130-133 Problems

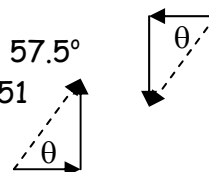
#1, 3, 5-7, 10, 12, 13, 24, 28, 30, 38, 46, 48, 66

### ***ANSWERS:***

#### **Ch. 4 Startup Assignment**

1. 75N
2. 115kg
3. 1152N
7. 68.4N

9. 780N

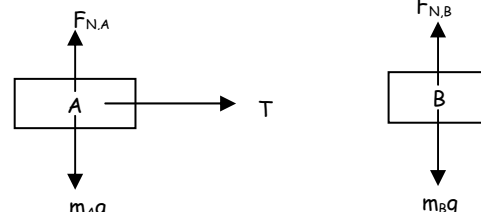
24.a. 19N and  $0.703\text{m/s}^2$  @  $57.5^\circ$ b. 14N and  $0.52\text{m/s}^2$  @  $51^\circ$ 

#### **Ch. 4 During-Chap Assignment Pt. 1**

- 5.a. 196N, 196N
- b. 294N, 98N
10. 12,720N
15.  $2.45\text{m/s}^2$  downward
16.  $0.435\text{m/s}^2$
22. Southwesterly
23. 1411N
- 25.a. 31.36N, 62.72N
- b. 36.48N, 72.96N

27. 6894N, 8863N

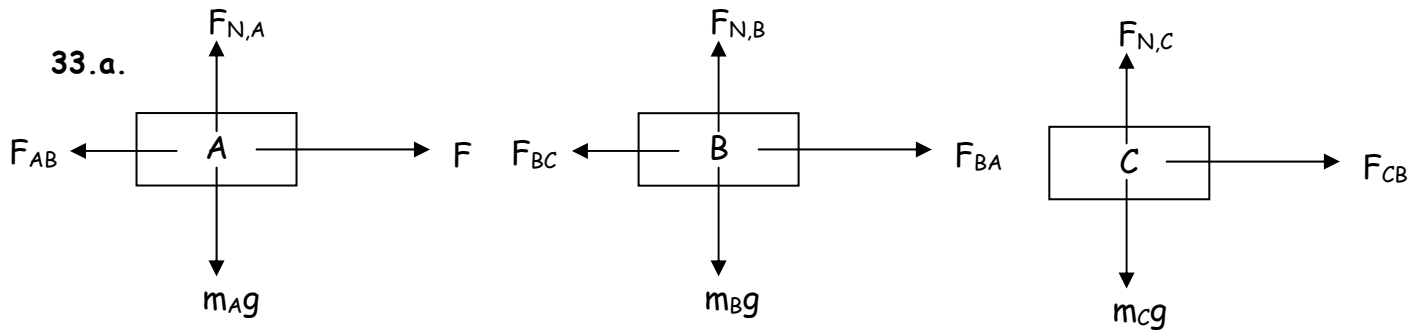
31.a.



$$31\text{b. } a = \frac{m_B g}{m_A + m_B} \quad T = \frac{m_A m_B g}{m_A + m_B}$$

32.  $25.48^\circ$





33b.  $a = \frac{F}{m_A + m_B + m_C}$       c.  $\Sigma F_A = \frac{F m_A}{m_A + m_B + m_C}$      $\Sigma F_B = \frac{F m_B}{m_A + m_B + m_C}$      $\Sigma F_C = \frac{F m_C}{m_A + m_B + m_C}$

33d.  $F_{CB} = F_{BC} = \frac{F m_C}{m_A + m_B + m_C}$      $F_{AB} = F_{BA} = \frac{F(m_B + m_C)}{m_A + m_B + m_C}$

33e.  $a = 2.67 \text{ m/s}^2$   
 $\Sigma F_A = \Sigma F_B = \Sigma F_C = 32 \text{ N}$   
 $F_{CB} = F_{BC} = 32 \text{ N}$   
 $F_{AB} = F_{BA} = 64 \text{ N}$

34. 3.93m      35.  $a = 1.73 \text{ m/s}^2$   
 $F_{TA} = 22.49 \text{ N}$   
 $F_{TB} = 20.76 \text{ N}$

#### Ch. 4 During-Chap Assignment Pt. 2

- |   |                             |
|---|-----------------------------|
| 36. 102.9N, 0N if no friction                         | 64. a. $2.16 \text{ m/s}^2$ |
| 41. 0.59  | 72. 4.31N                   |
| 47. 4.08m   | 75. $82.3 \text{ m/s}$      |
| 52. a. $2.58 \text{ m/s}^2$                           | 76. a. 11.25kg              |
| b. $6.93 \text{ m/s}$                                 | b. $0.88 \text{ m/s}^2$     |
| 56. 1.09kg  | 83. $12.12 \text{ m/s}$     |
| 60. $\mu = \frac{v^2}{2dg \cos \theta} - \tan \theta$ |                             |

#### Ch. 5 During-Chap Assignment

- |   |                                |
|---|--------------------------------|
| 1. a. $1.42 \text{ m/s}^2$  | 13. $8.52 \text{ m/s}$         |
| b. 35.5N  | 24. 1089.6m                    |
| 3. $5.97 \text{ E}^{-3} \text{ m/s}^2, 3.56 \text{ E}^{22} \text{ N}$ | 28. 1470N                      |
| 5. $0.94 \text{ g}'\text{s}$  | 30. $1.62 \text{ m/s}^2$       |
| 6. $3.55 \text{ m/s}^2$   | 38. $0.924 \text{ g}'\text{s}$ |
| 7. a. 3.73N   | 46. 1.41h                      |
| b. 9.61N  | 48. 1.97h                      |
| 10. 0.836   | 66. $6.51 \text{ m/s}$         |
| 12. 0.16  |                                |