

M331 Section 3. HOMEWORKS – Spring 2008

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SET 9 New!

Section 6.3: 3, 4, 15, 16, 18, 27, 28, 31, 32.

Section 6.4: 2, 3

SET 8

Section 6.1: 1, 2, 3, 6, 7, 8, 9, 10, 11, 15, 16, 17, 22

Section 6.2: 1, 2, 4, 5, 6, 10, 11, 12, 13

SET 7

Section 4.1: 1, 3, 7, 10, 11, 15, 17, 25

Section 4.2: 1, 2, 4, 11, 12, 19

Section 4.3: 2, 5, 7, 11, 12, 13

SET 6

Section 3.3: 1, 5, 7, 9, 11, 13, 19, 20, 21.

Section 3.4: 1; parts a),b)c) of 4, 5, 6. Then parts a) b) of 10, 11, 12.

Section 3.5: 3, 4, 7, 8, 11, 17, 18.

Section 3.6: 2, 3, 10, 11, 15, 16, 23, 24.

SET 5

Section 3.1: 5, 6, 8, 15, 16, 17, 18, 24, 27

Section 3.2: Do only parts a)b)d)e) for 1, 5, 7, 9.
Then do 11, 12, 13, 19, 20a)b)d), 21, 23.

SET 4

Section 2.2: 1 a)b)e), 2 a)b)e), 7, a)b)e), 9, 11, 12, 20.

Section 2.3: 1, 2, 7, 9, 10, 13, 14a)b)

SET 3

Section 1.6: 1, 4, 6, 11, 13, 16, 18, 28, 32, 34, 39 a)b) , 40a) b)

Section 1.9: 1, 3, 5, 6, 7, 10, 11, 13, 16, 25, 27.

Section 2.1: 9, 10, 17, 20, 21, 22

SET 2

Section 1.3: 1a); 2a); 3a), 7, 8 , 13, 15

Section 1.5: 5, 8 (all these are 1 problem); 12, 14, 15, 16

SET 1**Section 1.1:** 3, 5, 6, 10, 11, 15a)b), 16.**Additional Problems to Section 1.1:**

A1: A object with mass $m = 8$ kg and drag coefficient $\gamma = 1.5$ kg/sec is dropped from a height of 400 meters above the floor.

(a) Find the associated differential equation of motion according to Newton's second law.

(b) Find the velocity $v(t)$ at any time t .

(c) How long it will take to be 100 meters from the floor ?

(d) What will be its velocity when it is 100 meters from the floor?

A2: Suppose a building loses heat in accordance with Newton's law of cooling

$$\frac{du}{dt} = -k(u(t) - T)$$

where $u(t)$ is the temperature of the object at time t and T is a constant ambient temperature.

Assume the rate constant k has value 0.15 and that the interior temperature is 70 F when the building's heating system fails. If the external temperature is 10 F, how long will it take for the interior temperature to fall to 32 F ?

Section 1.2: 6, 7, 9, 12, 13, 15, 25, 27, 29, 32, 33, 39.