

MTH 3311 – Test #2

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Name _____

Directions: Do two of the three exercises.

1. A paratrooper and parachute weigh 240 lb. At the instant the parachute opens, he is traveling vertically downward at $40 \frac{\text{ft}}{\text{sec}}$. If the air resistance varies directly as the instantaneous velocity, and the air resistance is 80 lb when the velocity is $20 \frac{\text{ft}}{\text{sec}}$:

- a) Find the limiting velocity
- b) Determine the position and velocity at any time t .

2. Water at 90°C cools in 20 minutes to 75°C in a room of temperature of 25°C .

- a) Find the temperature of the water after 30 minutes
- b) When is the temperature 50°C ?

3. The demand and supply of a certain commodity are given in terms of thousands of units, respectively, by

$$D = 50 + 7p(t) + 2p'(t); \quad S = 350 - 8p(t) - 3p'(t).$$

At $t = 0$, the price of the commodity is 35 units.

- a) Find the price at any later time and obtain its graph.
- b) determine whether there is price stability and the equilibrium price if one exists.