

## MTH 3311 Test #2

SUMMER 2016

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Name \_\_\_\_\_

**Show CLEARLY how you arrive at your answers**

1. Solve, using the Method of Undetermined Coefficients:

$$y'' + y' - 6y = 36 \cos 3x - 24 \sin 3x$$

2. Solve, using the Method of Variation of Parameters:

$$y'' + y = \tan(x)$$

**From exercises #3 and #4, select one.**

3. The water in a jacuzzi is heated to  $100^\circ$  F and then the heating elements are turned off. After 1 hour, the temperature of the water is  $80^\circ$  F. If the temperature of the room is a constant  $70^\circ$  F, what will the temperature of the water in the jacuzzi be after 3 hours?
4. 100 kg of a radioactive substance is stored safely away. In 10 years, only 95 kg of the substance will remain. How much of the substance will remain in 100 years?