MATH 54 FALL 2017: DISCUSSION 205/208 QUIZ#13

GSI: CHRISTOPHER EUR, DATE: 12/1/2017

STUDENT NAME: _____

Problem 1. (5 points) Solve for $u(x,t)$ where $-\pi < x < \pi$ and $t > 0$ satisfying the following (wave) equation:

$$4u_{xx} = u_{tt}$$
$$u(-\pi, t) = u(\pi, t) = 0 \quad \forall t > 0$$
$$u(x, 0) = \sin 3x + 4\sin 5x$$
$$u_t(x, 0) = 2\cos 4x$$

Problem 2. (5 points) Solve for $u(x,t)$ where $-\frac{\pi}{2} < x < \frac{\pi}{2}$ and $t > 0$ satisfying the following (heat) equation:

$$5u_{xx} = u_t$$
$$u(-\pi, t) = u(\pi, t), \quad u_x(-\pi, t) = u_x(\pi, t) \quad \forall t > 0 \text{ (CAREFUL HERE!)}$$
$$u(x, 0) = 3\sin 2x + 5\cos 6x$$