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## Homework 6

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**Last name:** \_\_\_\_\_

**First name:** \_\_\_\_\_

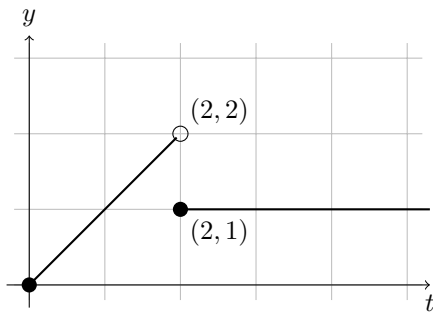
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*Due at the beginning of the class on Monday November 21st 2016.*

1. Use the definition of the Laplace transform to find the Laplace transform of the following functions:

(a)  $f(t) = e^{2t+1}$

- (b)  $f$  defined by its graph



2. Find the inverse Laplace transform of

(a)  $F(s) = \frac{9 + s}{4 - s^2}$ .

(b)  $G(s) = \frac{s + 3}{s^2(s^2 - 1)}$ .

(c)  $H(s) = \frac{s + 5}{s^2 + 4s + 13}$ .

3. Solve the initial value problem using the Laplace transform method

(a)  $y'' + 6y' + 5y = 4e^{-t}$ ,  $y(0) = 1$ ,  $y'(0) = 0$ .

(b)  $y'' - y = -2t$ ,  $y(0) = 0$ ,  $y'(0) = -1$ .