WRITE YOUR NAME:

MAP 2302 Quiz 20
Thursday November 14th

Use the method of partial fractions to rewrite the given function as a sum of fractions with simpler denominators.

$$F(s) = \frac{1}{s^2 - 7s + 12} = \frac{1}{(s-3)(s-4)}$$

$$F = \frac{1}{(s-3)(s-4)} = \frac{A}{s-3} + \frac{B}{s-4}$$

$\downarrow$ multiply both sides by $(s-3)(s-4)$

$$1 = A(s-4) + B(s-3)$$

METHOD 1: Convenient values of s.

$$s=3 \Rightarrow 1 = A \cdot (-1) + 0 \Rightarrow A = -1$$
$$s=4 \Rightarrow 1 = 0 + B \cdot 1 \Rightarrow B = 1$$

$$F = \frac{-1}{s-3} + \frac{1}{s-4}$$

METHOD 2: Expand and compare coefficients.

$$1 = As - 4A + Bs - 3B$$
$$0s + 1 = (A+B)s + (-4A - 3B) \rightarrow \begin{array}{l} A+B=0 \\ -4A-3B=1 \end{array} \rightarrow \begin{array}{l} 4A+4B=0 \\ -4A-3B=1 \\ \hline B=1 \end{array}$$
$$\rightarrow A = -1$$

$$F = \frac{-1}{s-3} + \frac{1}{s-4}$$

BTW $f = -e^{3t} + e^{4t}$