Quiz #3

Directions: Carefully read each question below and answer to the best of your ability in the space provided. You **MUST** show your work to receive full credit!

1. (3 points) Choose the correct setup for the partial fraction decomposition of

$$\frac{x}{(x+1)(x-1)^3(x^2+4)}.$$

A. $\dfrac{A}{x+1}+\dfrac{B}{(x-1)^3}+\dfrac{C}{(x-1)^2}+\dfrac{D}{x-1}+\dfrac{E}{x^2+4}$

B. $\dfrac{A}{x+1}+\dfrac{B}{(x-1)^3}+\dfrac{C}{(x-1)^2}+\dfrac{D}{x-1}+\dfrac{Ex+F}{x^2+4}$

C. $\dfrac{A}{x+1}+\dfrac{B}{(x-1)^3}+\dfrac{C}{(x-1)^2}+\dfrac{D}{x-1}+\dfrac{E}{x-2}+\dfrac{F}{x+2}$

D. $\dfrac{A}{x+1}+\dfrac{B}{(x-1)^3}+\dfrac{Cx+D}{x^2+4}$

E. None of the above

2. (7 points) Evaluate the following integral:

$$\int \frac{1}{x+x^2}dx.$$

Solution: First, note that

$$\frac{1}{x+x^2}=\frac{1}{x(x+1)}=\frac{1}{x}-\frac{1}{x+1},$$

then

$$\begin{aligned}\int \frac{1}{x+x^2}dx &= \int \frac{1}{x}dx-\int \frac{1}{x+1}dx\\ &= \boxed{\ln|x|-\ln|x+1|+C}\\ &= \boxed{\ln\left|\frac{x}{x+1}\right|+C}.\end{aligned}$$

Name: _____

Section (circle one): 001 002

Question:	1	2	Total
Points:	3	7	10
Score:			