M242 Q5(c) (S. Zhang) (8 points). Name:_____

1. Find

$$\int \frac{-2x^2+3x-8}{(x-2)(x^2+1)}dx$$

- **ans:** Partial fractions:

$$\frac{A}{x-2}+\frac{Bx+C}{x^2+1}$$

$$-2x^2+3x-8 = A(x^2+1)+(Bx+C)(x-2)$$

$$x=2,\ -2(4)+3(2)-8 = A5,\ A=-2$$

$$x=0,\ -8 = A+C(-2),\ 2C = 8+A,\ C=3$$

Compare coefficents of x^2

$$-2 = A+B,\ B=-2-A=0$$

$$\begin{aligned}\int \frac{-2x^2+3x-8}{(x-2)(x^2+1)}dx &= \int \frac{-2}{x-2}dx+\int \frac{3}{x^2+1}dx \\ &= -2\ln|x-2|+3\tan^{-1}x+C\end{aligned}$$