

PARTIAL FRACTIONS

FIND THE FOLLOWING

$$1) \int \frac{-x^3 + 10x^2 + 4x + 5}{(x+1)(x^2+1)^2} dx$$

ANSWER: $3 \ln|x+1| - \frac{3}{2} \ln|x^2+1| + 2 \arctan x - \frac{5}{2} \cdot \frac{1}{x^2+1} + C$

$$2) \int \frac{6x^5 - 13x^4 - 17x^3 + 55x^2 + 5x - 6}{x^2(x-3)(3x+1)} dx$$

ANSWER: $x^2 + x - 7 \ln|x| - \frac{2}{x} + \ln|3x+1| + 5 \ln|x-3| + C$

$$3) \int \frac{6x^3 + 27x^2 + 41x + 21}{(3x^2 + ax + 5)^2} dx$$

ANSWER: $\frac{1}{3} \ln|3x^2 + ax + 5| - \frac{2}{3} \cdot \frac{1}{3x^2 + ax + 5} + C$