Worksheet #5

I. Write a partial fraction form of the following. Do NOT solve for the constants!

1. $\dfrac{1+3x+4x^2}{x^3+4x^2+3x}$

2. $\dfrac{1}{x^4+9x^2}$

3. $\dfrac{3x^3-7x}{(x^2+5)(x^2-4)}$

4. $\dfrac{5x^3+2x^2}{(x-4)(x^2+8x+90)(x-3)^2}$

5. $\dfrac{x^7-6x^5+1}{(x-1)(2x-3)^3(4x^2+1)(x^2+36)^2}$

6. $\dfrac{3x^2+1}{x^4-16}$

7. $\dfrac{6x+7}{(x^2-2x+1)(x^2+5x+9)}$

8. $\dfrac{x^2+x}{x^3+3x^2+2x}$

9. $\dfrac{2x^2+1}{x^5-4x^4+4x^3}$

10. $\dfrac{1-8x}{x^2(x+2)(x^2+3)^2}$

II. Compute the following antiderivatives.

11. $\int \dfrac{x^2+2x+9}{x^3+9x}\,dx$

12. $\int \dfrac{x^4-x^2+3x+1}{(x-1)(x^2+1)^2}\,dx$

13. $\int \dfrac{3x^2}{x^2-4}\,dx$

14. $\int \dfrac{74x^2+3}{25x^4+x^2}\,dx$

15. $\int \dfrac{2x^4+x^3+4x^2-3x+2}{x(x^2+1)^2}\,dx$

16. $\int \dfrac{1}{x^2-16}\,dx$

17. $\int \dfrac{1}{\sqrt{x^2-16}}\,dx$

18. $\int \dfrac{x}{\sqrt{x^2-16}}\,dx$

19. $\int \dfrac{6x^2+21x+20}{(x+1)(x+2)^2}\,dx$

20. $\int \dfrac{12x^2+2x+27}{6x(4x^2+9)}\,dx$