第三单元测试题

一、 求下列不定积分:

1.
$$\int 3^x e^x dx$$

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

1.
$$\int 3^x e^x dx$$
 2.
$$\int \frac{dx}{1+\cos^2x}$$
 3.
$$\int \tan^{10}x \sec^2x dx$$

$$4. \int \frac{dx}{e^x + e^{-x}}$$

$$5. \int \frac{1-x}{\sqrt{9-x^2}} dx$$

4.
$$\int \frac{dx}{e^{x}+e^{-x}}$$
 5.
$$\int \frac{1-x}{\sqrt{9-x^{2}}} dx$$
 6.
$$\int \cos^{2}(\omega t) \sin(\omega t) dt$$

7.
$$\int \frac{dx}{x \ln x}$$

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 8. $\int \sin 2x \cos 3x dx$ 9. $\int \tan^3 x \sec x dx$

$$10. \int \frac{dx}{1+\sqrt[3]{x+1}}$$

10.
$$\int \frac{dx}{1+\sqrt[3]{x+1}}$$
 11. $\int \frac{\sqrt{x^2-9}}{x} dx$ 12. $\int \frac{dx}{1+\sqrt{1-x^2}}$

12.
$$\int \frac{dx}{1+\sqrt{1-x^2}}$$

13.
$$\int \ln(x^2 + 1) dx$$
 14.
$$\int x^2 arctanx dx$$

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15.
$$\int e^{-2x} \sin \frac{x}{2} dx$$
 16.
$$\int \frac{1-x-x^2}{(x^2+1)^2} dx$$

16.
$$\int \frac{1-x-x^2}{(x^2+1)^2} dx$$

17.
$$\int \frac{x^2+1}{(x+1)^2(x-1)} dx$$

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 18.
$$\int \frac{x^2}{1+x^2} arctanx dx$$

$$19. \qquad \int \frac{\sin x \cos^3 x}{1 + \cos^2 x} dx$$

$$20. \int \frac{xdx}{x^8 - 1}$$

二、设f(x)的原函数 F(x)>0,且 F(0)=1.当 $x \ge 0$ 时,有 $f(x)F(x)=\sin^2 2x$,试求 f(x)