The Fundamental Theorem of Calculus- HW Problems

Evaluate the definite integrals with part 2 of the Fundamental Theorem of Calculus

1. $\int_0^2 2x\,dx$

2. $\int_1^3 (3x^2 + 1)\,dx$

3. $\int_0^1 (2t + \sqrt{t})\,dt$

4. $\int_1^4 \sqrt{\dfrac{4}{x}}\,dx$

5. $\int_0^1 x(\sqrt{x} - \frac{1}{\sqrt{x^3}})\,dx$

6. $\int_0^{\frac{\pi}{2}} \cos(x)\,dx$

7. $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \sec^2(\theta)\,d\theta$

8. $\int_{-\frac{\pi}{3}}^{\frac{\pi}{3}} (\sec(x))(\tan(x))\,dx$

9. $\int_1^4 (\dfrac{x^2 - x}{\sqrt{x}})\,dx$

10. $\int_{\frac{\pi}{6}}^{\frac{\pi}{4}} (\dfrac{\sin^2(x) + \cos^2(x)}{\sin^2(x)})\,dx$

Use part 1 of the Fundamental Theorem of Calculus to find $F'(x)$.

11. $F(x) = \int_1^x \sqrt{1+t^3} \, dt$

12. $F(x) = \int_2^x \cos(\sqrt{t}) \, dt$

13. $F(x) = \int_x^3 \sin(t^2) \, dt$

14. $F(x) = \int_2^{x^3} \sqrt{1+t^3} \, dt$

15. $F(x) = \int_{\sin(x)}^4 \frac{t}{\sqrt{1+t^4}} \, dt$

16. $F(x) = \int_x^{x^2} \sin(\sqrt{1+t^2}) \, dt$