Calculus Name_____ ID: 1

Second Fundamental Theorem of Calculus

Date_____ Period____

For each problem, find $F'(x)$.

1) $F(x) = \int_{1}^{x} (2t - 2)\, dt$

$F'(x) = 2x - 2$

2) $F(x) = \int_{1}^{x} (t - 1)\, dt$

$F'(x) = x - 1$

3) $F(x) = \int_{-3}^{x} (-t^2 - 2t - 3)\, dt$

$F'(x) = -x^2 - 2x - 3$

4) $F(x) = \int_{-\frac{\pi}{6}}^{x^2} \sec^2 t\, dt$

$F'(x) = 2x\sec x^2 \sec x^2$

5) $F(x) = \int_{-2}^{x^2} 3e^t\, dt$

$F'(x) = 6xe^{x^2}$

6) $F(x) = \int_{1}^{3x} \frac{5}{(t+1)^3}\, dt$

$F'(x) = \frac{15}{(3x+1)^3}$

7) $F(x) = \int_{1}^{3x} \frac{2}{t}\, dt$

$F'(x) = \frac{2}{x}$

8) $F(x) = \int_{-5}^{x^2} 3e^{t+3}\, dt$

$F'(x) = 6xe^{x^2+3}$

9) $F(x) = \int_{3}^{2x} 3(t-3)^{\frac{1}{2}}\, dt$

$F'(x) = 6(2x-3)^{\frac{1}{2}}$

10) $F(x) = \int_{x}^{2x} 5t^{\frac{1}{2}}\, dt$

$F'(x) = 10 \cdot (2x)^{\frac{1}{2}} - 5x^{\frac{1}{2}}$

11) $F(x) = \int_{x}^{2x} (-t^3 + 2t^2 + 1)\, dt$

$F'(x) = -15x^3 + 14x^2 + 1$

12) $F(x) = \int_{x}^{x^2} -2e^t\, dt$

$F'(x) = -4xe^{x^2} + 2e^x$

13) $F(x) = \int_{x}^{x^2} -\frac{4}{t}\, dt$

$F'(x) = -\frac{4}{x}$

14) $F(x) = \int_{x}^{x^2} -2\cos t\, dt$

$F'(x) = -4x\cos x^2 + 2\cos x$

15) $F(x) = \int_{x}^{x^2} \frac{2}{(t+3)^3}\, dt$

$F'(x) = \frac{4x}{(x^2+3)^3} - \frac{2}{(x+3)^3}$

16) $F(x) = \int_{-2}^{x^2} 3(t+2)^{\frac{1}{2}}\, dt$

$F'(x) = 6x(x^2+2)^{\frac{1}{2}}$