Calculus Practice: Second Fundamental Theorem of Calculus 1b

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

1) $F(x) = \displaystyle\int_{-5}^{x^2} \left(-t^2 - 6t - 5\right) dt$

2) $F(x) = \displaystyle\int_{-6}^{x} \left(t + 2\right) dt$

3) $F(x) = \displaystyle\int_{-2}^{x} \left(2t + 2\right) dt$

4) $F(x) = \displaystyle\int_{1}^{x^2} \left(t^3 - 9t^2 + 24t - 14\right) dt$

5) $F(x) = \displaystyle\int_{-2}^{x} 5t^{\frac{1}{3}} dt$

6) $F(x) = \displaystyle\int_{-5}^{x^2} 4t^{\frac{1}{3}} dt$

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

8) $F(x) = \displaystyle\int_{x}^{2x} 5(t - 2)^{\frac{1}{2}} dt$

9) $F(x) = \displaystyle\int_{-4}^{x} \frac{5}{t^2} dt$

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

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

12) $F(x) = \displaystyle\int_{1}^{3x} -\dfrac{1}{t}\, dt$

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

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

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

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

17) $F(x) = \displaystyle\int_{\frac{\pi}{2}}^{x} 2\csc^{2} t\, dt$

18) $F(x) = \displaystyle\int_{x}^{2x} \csc t\cot t\, dt$

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

20) $F(x) = \displaystyle\int_{x}^{x^2} \csc t\cot t\, dt$

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

1) $F(x) = \displaystyle\int_{-5}^{x^2} \left(-t^2 - 6t - 5\right) dt$

$\quad F'(x) = -2x^5 - 12x^3 - 10x$

2) $F(x) = \displaystyle\int_{-6}^{x} (t + 2)\, dt$

$\quad F'(x) = x + 2$

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

$\quad F'(x) = 2x + 2$

4) $F(x) = \displaystyle\int_{1}^{x^2} \left(t^3 - 9t^2 + 24t - 14\right) dt$

$\quad F'(x) = 2x^7 - 18x^5 + 48x^3 - 28x$

5) $F(x) = \displaystyle\int_{-2}^{x} 5t^{\frac{1}{3}}\, dt$

$\quad F'(x) = 5x^{\frac{1}{3}}$

6) $F(x) = \displaystyle\int_{-5}^{x^2} 4t^{\frac{1}{3}}\, dt$

$\quad F'(x) = 8x^{\frac{5}{3}}$

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

$\quad F'(x) = 4x^2 - 2x^{\frac{1}{2}}$

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

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

9) $F(x) = \displaystyle\int_{-4}^{x} \frac{5}{t^2}\, dt$

$\quad F'(x) = \dfrac{5}{x^2}$

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

$\quad F'(x) = -\dfrac{8}{x^3} + \dfrac{4}{x^2}$

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

$F'(x) = \dfrac{3}{x^2}$

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

$F'(x) = -\dfrac{1}{x}$

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

$F'(x) = -e^x$

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

$F'(x) = 3e^x$

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

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

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

$F'(x) = -9e^{3x-1}$

17) $F(x) = \displaystyle\int_{\frac{\pi}{2}}^{x} 2\csc^2 t\, dt$

$F'(x) = 2\csc x \csc x$

18) $F(x) = \displaystyle\int_{x}^{2x} \csc t\cot t\, dt$

$F'(x) = 2\csc 2x\cot 2x - \csc x\cot x$

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

$F'(x) = 4x\sec x^2\tan x^2$

20) $F(x) = \displaystyle\int_{x}^{x^2} \csc t\cot t\, dt$

$F'(x) = 2x\csc x^2\cot x^2 - \csc x\cot x$