AP Calculus Name_____

Antiderivatives Integrals – Day 1

Find the general antiderivative of each function.

1. $f(x) = 6x^2 - 8x + 3$

2. $f(x) = 1 - x^3 + 5x^5 - 3x^7$

3. $f(x) = \sqrt{x} + \sqrt[3]{x}$

4. $f(x) = \frac{3}{x^2} + \frac{5}{x}$

5. $f(x) = \frac{x^3 + 2x^2}{\sqrt{x}}$

6. $f(x) = \sqrt[3]{x^2} - \sqrt{x^3}$

7. $f(x) = 3\cos x - 4\sin x$

8. $f(x) = 4\sqrt{x} + e^x - \sec x \tan x$

9. $f(x) = \frac{x^2 + x + 1}{x}$

10. $f(x) = 6x^2 - 7\sec^2 x$

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Antiderivatives

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Find f(x).

11. $f'(x) = 1 - 6x;\ f(0) = 8$

12. $f'(x) = 3\sqrt{x} - \frac{1}{\sqrt{x}};\ f(1) = 2$

13. $f'(x) = 3\cos x + 5\sin x;\quad f(0) = 4$

14. $f''(x) = x;\ f(0) = -3, f'(0) = 2$

15. $f''(x) = x^2 + 3\cos x;\ f(0) = 2, f'(0) = 3$

16. $f''(x) = 12x^2 - 6x + 2;\ f(0) = 1, f'(2) = 11$

Answers:

1.) $F(x) = 2x^3 - 4x^2 + 3x + C$

2.) $F(x) = x - \frac{1}{4}x^4 + \frac{5}{6}x^6 - \frac{3}{8}x^8 + C$

3.) $F(x) = \frac{2}{3}x^{\frac{3}{2}} + \frac{3}{4}x^{\frac{4}{3}} + C$

4.) $F(x) = -3x^{-1} + 5\ln|x| + C$

$F(x) = \frac{-3}{x} + 5\ln|x| + C$

5.) $F(x) = \frac{2}{7}x^{\frac{7}{2}} + \frac{4}{5}x^{\frac{5}{2}} + C$

6.) $F(x) = \frac{3}{5}x^{\frac{5}{3}} - \frac{2}{5}x^{\frac{5}{2}} + C$

7.) $F(x) = 3\sin(x) + 4\cos(x) + C$

8.) $F(x) = \frac{8}{3}x^{\frac{3}{2}} + e^x - \sec(x) + C$

9.) $F(x) = \frac{1}{2}x^2 + x + \ln|x| + C$

10.) $F(x) = 2x^3 - 7\tan x + C$

11.) $f(x) = x - 3x^2 + 8$

12.) $f(x) = 2\sqrt{x^3} - 2\sqrt{x} + 2$

13.) $f(x) = 3\sin x - 5\cos x + 9$

14.) $f(x) = \frac{1}{6}x^3 + 2x - 3$

15.) $f(x) = \frac{1}{12}x^4 - 3\cos x + 3x + 5$

16.) $f(x) = x^4 - x^3 + x^2 - 13x + 1$