8.3 Antiderivatives

NAME:_____

Corrective Assignment

DATE:_____

Find the antiderivatives of the following.

1. $f'(x) = 4\sqrt[4]{x^3} + \frac{5}{\sqrt[3]{x^2}} + 2$

2. $\frac{dy}{dx} = x^{-2} - x^{-1} + \sqrt[5]{x}$

3. $y' = \sin x + x^{\frac{3}{2}}$

Evaluate the indefinite integrals.

4. $\int \left(3x^{\frac{5}{2}} + 2e^x\right) dx$

5. $\int \left(\frac{5}{x} - \sin x\right) dx$

6. $\int (\sin x - \cos x)\, dx$

Find the function that satisfies the given conditions.

7. $s'(t) = 8t^2 + 6t - 1$ and $s(3) = 50$

8. $\frac{dy}{dx} = 2e^x + \sin x$ and $y(0) = 2$

9. $f''(x) = 3x^2 - 8x$ and $f'(-2) = -20$ and $f(1) = 3$

10. $f''(x) = 6x^2 - \sin x$ and $f'(0) = 0$ and $f(0) = 2$

Word Problems!

11. A particle moves along the *x*-axis for $t \geq 0$ with an acceleration of $a(t) = 12t + 6$ where *t* is time in seconds. The particle's velocity at $t = 3$ is 36 cm/sec. The initial position of the particle is 4 cm. What is the position of the particle when the velocity is zero?

12. A particle moves along the *x*-axis for $t \geq 0$ with an acceleration of $a(t) = 24t$ where *t* is time in seconds. The particle's velocity at $t = 1$ is -36 cm/sec. The position of the particle at $t = 2$ is -10 cm. What is the position of the particle when the velocity is zero?

13. A particle moves along the *y*-axis for $t \geq 0$ with an velocity of $v(t) = 12t^2 - 24t$. The particle's initial position is $10\ cm$. Find the position of the function at the particle's minimum velocity.

14. A particle moves along the *y*-axis for $t \geq 0$ with postion of $x(t) = 2t^3 + 6t^2 - 16t - 4$ where *t* is time in seconds and the initial position is -4 inches. Find the acceleration of the particle when $t = 4$.

ANSWERS TO CORRECTIVE ASSIGNMENT

1. $f(x) = \frac{16}{7}\sqrt[4]{x^7} + 15\sqrt[3]{x} + 2x + c$	2. $y = -\frac{1}{x} - \ln x + \frac{5}{6}\sqrt[5]{x^6} + c$		3. $y = -\cos x + \frac{2}{5}\sqrt{x^5} + c$	
4. $\frac{6}{7}\sqrt{x^7} + 2e^x + c$	5. $5\ln x + \cos x + c$		6. $-\cos x - \sin x + c$	
7. $s(t) = \frac{8}{3}t^3 + 3t^2 - t - 46$	8. $y = 2e^x - \cos x + 1$		9. $f(x) = \frac{1}{4}x^4 - \frac{4}{3}x^3 + 4x + \frac{1}{12}$	
10. $f(x) = \frac{1}{2}x^4 + \sin x - x + 2$	11. -40 cm	12. -10 cm	13. 2 cm	14. 60 in/sec^2