4.10 EXERCISES

For the following exercises, show that $F(x)$ are antiderivatives of $f(x)$.

465. $F(x) = 5x^3 + 2x^2 + 3x + 1,\ f(x) = 15x^2 + 4x + 3$

466. $F(x) = x^2 + 4x + 1,\ f(x) = 2x + 4$

467. $F(x) = x^2 e^x,\ f(x) = e^x\left(x^2 + 2x\right)$

468. $F(x) = \cos x,\ f(x) = -\sin x$

469. $F(x) = e^x,\ f(x) = e^x$

For the following exercises, find the antiderivative of the function.

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

471. $f(x) = e^x - 3x^2 + \sin x$

472. $f(x) = e^x + 3x - x^2$

473. $f(x) = x - 1 + 4\sin(2x)$

For the following exercises, find the antiderivative $F(x)$ of each function $f(x)$.

474. $f(x) = 5x^4 + 4x^5$

475. $f(x) = x + 12x^2$

476. $f(x) = \frac{1}{\sqrt{x}}$

477. $f(x) = (\sqrt{x})^3$

478. $f(x) = x^{1/3} + (2x)^{1/3}$

479. $f(x) = \frac{x^{1/3}}{x^{2/3}}$

480. $f(x) = 2\sin(x) + \sin(2x)$

481. $f(x) = \sec^2(x) + 1$

482. $f(x) = \sin x \cos x$

483. $f(x) = \sin^2(x)\cos(x)$

484. $f(x) = 0$

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

486. $f(x) = \csc x \cot x + 3x$

487. $f(x) = 4\csc x \cot x - \sec x \tan x$

488. $f(x) = 8\sec x(\sec x - 4\tan x)$

489. $f(x) = \frac{1}{2}e^{-4x} + \sin x$

For the following exercises, evaluate the integral.

490. $\int (-1)dx$

491. $\int \sin x dx$

492. $\int (4x + \sqrt{x})dx$

493. $\int \frac{3x^2 + 2}{x^2}dx$

494. $\int (\sec x \tan x + 4x)dx$

495. $\int \left(4\sqrt{x} + \sqrt[4]{x}\right)dx$

496. $\int \left(x^{-1/3} - x^{2/3}\right)dx$

497. $\int \frac{14x^3 + 2x + 1}{x^3}dx$

498. $\int (e^x + e^{-x})dx$

For the following exercises, solve the initial value problem.

499. $f'(x) = x^{-3},\ f(1) = 1$

500. $f'(x) = \sqrt{x} + x^2,\ f(0) = 2$

501. $f'(x) = \cos x + \sec^2(x),\ f\left(\frac{\pi}{4}\right) = 2 + \frac{\sqrt{2}}{2}$

502. $f'(x) = x^3 - 8x^2 + 16x + 1,\ f(0) = 0$