Problems for Gateway #2: Antiderivatives of Exponential Functions

1. Calculate the antiderivative of: $f(x) = e^x$

2. Calculate the antiderivative of: $f(x) = \ln(2) \cdot 2^x$

3. Calculate the antiderivative of: $f(x) = \ln(4) \cdot 4^x$

4. Calculate the antiderivative of: $f(x) = 3^x$

5. Calculate the antiderivative of: $f(x) = 5^x$

6. Calculate the antiderivative of: $f(x) = \dfrac{6^x}{\ln(6)}$

7. Calculate the antiderivative of: $f(x) = \dfrac{7^x}{\ln(7)}$

8. Calculate the antiderivative of: $f(x) = \ln(2) \cdot 8^x$

9. Calculate the antiderivative of: $f(x) = 10^x$

10. Calculate the antiderivative of: $f(x) = 3 \cdot 3^x$

Answers

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

4. $F(x) = \dfrac{3^x}{\ln(3)} + C$ 5. $F(x) = \dfrac{5^x}{\ln(5)} + C$ 6. $F(x) = \dfrac{6^x}{\left[\ln(6)\right]^2} + C$

7. $F(x) = \dfrac{7^x}{\left[\ln(7)\right]^2} + C$ 8. $F(x) = \ln(2) \cdot \dfrac{8^x}{\ln(8)} + C$

9. $F(x) = \dfrac{10^x}{\ln(10)} + C$ 10. $F(x) = \dfrac{3 \cdot 3^x}{\ln(3)} + C$