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Date: \_\_\_\_\_

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Course: MAC 2311 – Calculus and  
Analytical Geometry I

Assignment: Section 7.1 Enhanced  
Assignment

1. Rewrite the expression  $\log_6 216 = 3$  in equivalent exponential form.

The equivalent exponential form is  $216 = 6^3$ .

2. Rewrite the expression  $27 = 3^3$  in equivalent logarithmic form.

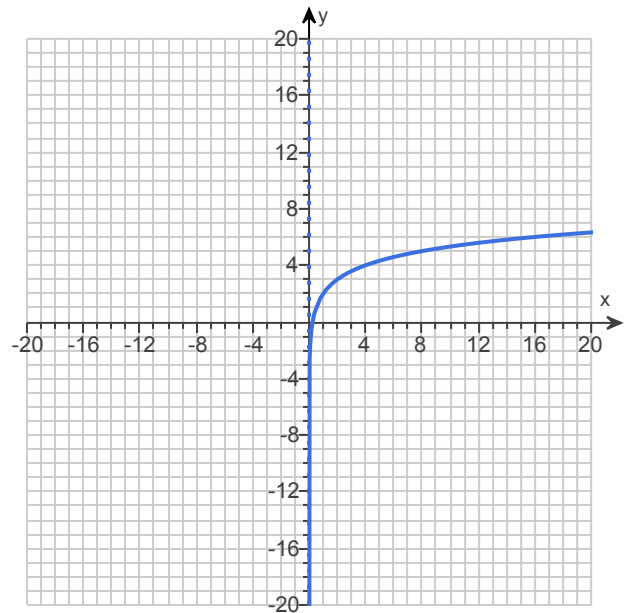
The equivalent logarithmic form is  $\log_3 27 = 3$ .

3. Use the graph of  $f(x) = \log_2 x$  to graph the function  $f(x) = (\log_2 x) + 2$ . Then give the domain and range.

Use the graphing tool to graph the function.

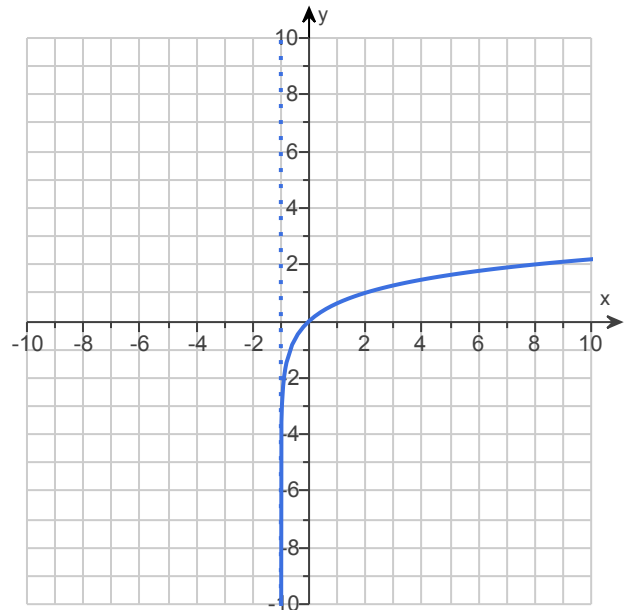
The domain is  $(0, \infty)$ .  
(Type your answer in interval notation.)

The range is  $(-\infty, \infty)$ .  
(Type your answer in interval notation.)



4. Use the graph of  $f(x) = \log_3 x$  to graph the function  $f(x) = \log_3(x + 1)$ .

Use the graphing tool to graph the function.



5. Evaluate the integral.

$$\int_{-7}^{-4} \frac{dx}{x}$$

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$$\int_{-7}^{-4} \frac{dx}{x} = \underline{\ln \frac{4}{7}}$$

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6. Evaluate the integral.

$$\int \frac{16 \sec^2(4t)}{9 + 4 \tan(4t)} dt$$

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$$\int \frac{16 \sec^2(4t)}{9 + 4 \tan(4t)} dt = \underline{\ln |9 + 4 \tan(4t)| + C}$$

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7. Evaluate  $\int \frac{dx}{4\sqrt{x} + 4x}$ .

$$\int \frac{dx}{4\sqrt{x} + 4x} = \underline{\frac{1}{2} \ln(1 + \sqrt{x}) + C}$$

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8. Evaluate the integral.

$$\int_{\ln 4}^{\ln 6} e^x dx$$

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$$\int_{\ln 4}^{\ln 6} e^x dx = \underline{2}$$

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9. Find the most general antiderivative or indefinite integral.

$$\int \left( \frac{1}{x^{11}} - x^{11} - \frac{1}{4} \right) dx$$

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$$\int \left( \frac{1}{x^{11}} - x^{11} - \frac{1}{4} \right) dx = \underline{-\frac{1}{10x^{10}} - \frac{x^{12}}{12} - \frac{x}{4} + C}$$

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10. Evaluate the integral.

$$\int \frac{e^{4\sqrt{s}}}{\sqrt{s}} ds$$

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$$\int \frac{e^{4\sqrt{s}}}{\sqrt{s}} ds = \underline{\frac{1}{2} e^{4\sqrt{s}} + C}$$

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11. Evaluate the integral  $\int 16t^7 e^{-t^8} dt$ .

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$$\int 16t^7 e^{-t^8} dt = \underline{-\frac{2}{e^{t^8}} + C}$$

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12. Evaluate the following integral.

$$\int_{\ln(3\pi/2)}^{\ln(11\pi/6)} 5e^v \cos e^v dv$$

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$$\int_{\ln(3\pi/2)}^{\ln(11\pi/6)} 5e^v \cos e^v dv = \underline{2.5} \quad (\text{Simplify your answer.})$$

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13. Solve the initial value problem.

$$\frac{dv}{dt} = \frac{9}{t\sqrt{t^2-1}}, \quad t > 1, \quad v(2) = 0$$

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$$v(t) = \underline{9 \sec^{-1} t - 3\pi}$$

(Type an exact answer, using  $\pi$  as needed.)

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14. Evaluate the integral.

$$\int \frac{6e^{6t}}{6 + e^{6t}} dt$$

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$$\int \frac{6e^{6t}}{6 + e^{6t}} dt = \underline{\ln(6 + e^{6t}) + C}$$

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15. Evaluate the integral.

$$\int_1^{\sqrt{3}} x^2(x^2) dx$$

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$$\int_1^{\sqrt{3}} x^2(x^2) dx = \underline{\frac{3}{\ln 2}} \quad (\text{Type an exact answer.})$$

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16. Evaluate  $\int_1^7 \frac{6^{\ln x}}{x} dx$ .

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$$\int_1^7 \frac{6^{\ln x}}{x} dx = \underline{\frac{6^{\ln 7} - 1}{\ln 6}}$$

(Type an exact answer.)

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17. Evaluate the integral  $\int_0^2 (\sqrt{5} + 1)x^{\sqrt{5}} dx$ .

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$$\int_0^2 (\sqrt{5} + 1)x^{\sqrt{5}} dx = \underline{2^{\sqrt{5} + 1}}$$

(Type an exact answer, using radicals as needed.)

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18. Evaluate the integral  $\int \frac{dx}{4x \log_5 x}$ .

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$$\int \frac{dx}{4x \log_5 x} = \underline{\frac{\ln 5}{4} \ln |\ln x| + C}$$

19. Solve the initial value problem.

$$\frac{dy}{dt} = 3e^{3t} \sin(e^{3t} - 8), \quad y(\ln 2) = 0$$

The solution is  $y = \underline{1 - \cos(e^{3t} - 8)}$ .

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20. Solve the initial value problem.

$$\frac{d^2 y}{dx^2} = 3e^{-x}, \quad y(0) = 0, \quad y'(0) = 4$$

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$$y = \underline{3e^{-x} + 7x - 3}$$

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21. Solve the initial value problem.

$$\frac{dy}{dx} = 1 + \frac{1}{x}, \quad y(1) = 6$$

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$$y = \underline{x + \ln |x| + 5}$$

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