

Name _____

Date _____

Solve for the given variable. Show all your work – round to 3 decimals.

1. $11(4^{x+2}) - 18 = 1082$

2. $\log_5(6x+1) = \log_5(3x+16)$

3. $-3e^{4x} - 7 = -40$

4. $12 - 3\ln(2x) = 6$

5. $\log_6 x + \log_6(x+5) = 2$

6. $1296^{x-1} = 6^{x-1}$

7. You purchase a car for \$27,000. The value of the car decreases 10% each year.

- Write the equation for the car's value in terms of the number of years since the purchase.
- What is the value of the car after 4 years?
- When will the car be worth half the original value?

8. You deposit \$5100 in an account that earns 4.5% annual interest. Find the balance after 10 years if the interest is compounded:

a. Semi-Annually

b. Quarterly

c. Continuously

b. How long would it take to double your investment if it is compounded continuously?

<p>9. Rewrite as a log:</p> $\left(\frac{1}{4}\right)^{-3} = 64$	<p>10. Rewrite as an exponential</p> $\log_5\left(\frac{1}{125}\right) = h$
<p>11. Expand $\log_4 \frac{16d^5}{b^4c^3}$</p>	<p>12. Expand $\ln y^4 \sqrt[3]{y+2}$</p>
<p>13. Condense</p> $4\ln b - \ln 7 - \ln g - 5\ln j$	<p>14. Condense</p> $\log_6 2 - \frac{1}{3}\log_6(x+3) - 4\log_6 y$

Find the Domain, Range, and Asymptote of each function

<p>15. $f(x) = \log_3(-x-3) + 2$</p> <p>Domain: _____</p> <p>Range: _____</p> <p>Asymptote: _____</p>	<p>16. $f(x) = -3^{x-2} + 7$</p> <p>Domain: _____</p> <p>Range: _____</p> <p>Asymptote: _____</p>
<p>17. $h(x) = \ln(3x-4) - 5$</p> <p>Domain: _____</p> <p>Range: _____</p> <p>Asymptote: _____</p>	<p>18. $g(x) = 2^{x-2} - 3$</p> <p>Domain: _____</p> <p>Range: _____</p> <p>Asymptote: _____</p>

Describe the Transformation in each function

<p>19. $f(x) = \log_4(-x-1) - 2$</p>	<p>20. $f(x) = -2^x - 1$</p>
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State whether the function is increasing or decreasing and write the interval of increase/decrease.

21. $f(x) = -2^x - 5$

22. $f(x) = \log_{\frac{1}{2}}(-x+1) + 2$

23. A) Is the table below an exponential function or a logarithmic function?

B) Does the function have a vertical or horizontal asymptote?

C) What is the equation of the **asymptote**?

X	F(x)
-2	2.33333
-1	3
0	5
1	11
2	29

24. A) Is the table below an exponential function or a logarithmic function?

B) Does the function have a vertical or horizontal asymptote?

C) What is the equation for the **asymptote**?

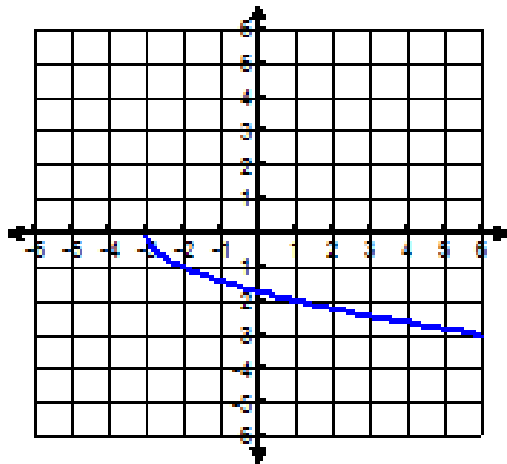
X	F(x)
1.5	-0.631
2	0
4	1
10	2

Find the Inverse of the Functions Below

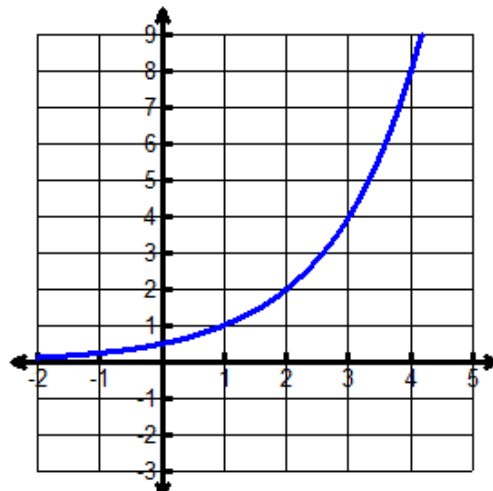
25. $y = 3^{x+1} - 4$

26. $y = \log_2(x - 1)$

27. Graph the inverse



28. Graph the inverse

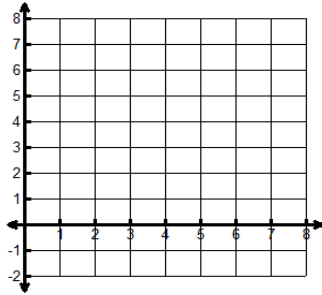


29. Prove whether the functions INVERSES using composite functions. Must show your work!

$$f(x) = 3x - 2$$

$$g(x) = \frac{x+2}{3}$$

30. $y = 2^{x-3} + 1$



Transformations _____

State 3 points on Graph _____

Domain _____ Range _____

Asymptote _____

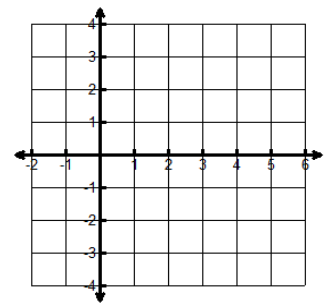
X-intercept _____ Y-intercept _____

Increasing or Decreasing _____

$x \rightarrow \text{_____}, f(x) \rightarrow \text{_____}$

End Behavior: $x \rightarrow \text{_____}, f(x) \rightarrow \text{_____}$

31. $y = -\log_2(x-1)$



Transformations _____

State 3 points on Graph _____

Domain _____ Range _____

Asymptote _____

X-intercept _____ Y-intercept _____

Increasing or Decreasing _____

$x \rightarrow \text{_____}, f(x) \rightarrow \text{_____}$

End Behavior: $x \rightarrow \text{_____}, f(x) \rightarrow \text{_____}$