9.3

SM3 Exponential Functions 2019-2020

Name _____ **Date** _____ **Period** _____

Approximate the value using a calculator. Express answer rounded to three decimal places.

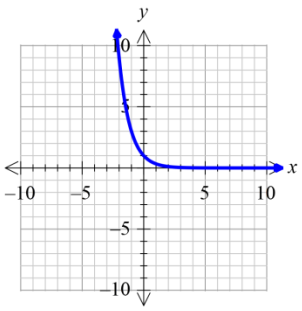
1. $5^{2.71}$ 2. $e^{3.14}$ 3. 2.1^{3}

The graph of an exponential function is given. Match the graph to one of the following functions. Use transformations to find the answers. Do not use a calculator.

a) $y = 3^x$ *b*) $y = 3^{-x}$ *c*) $y = -3^x$ *d*) $y = -3^{-x}$

e) $y = 3^x - 1$ *f*) $y = 3^{x-1}$ *g*) $y = 3^{1-x}$ *h*) $y = 1 - 3^x$

4.



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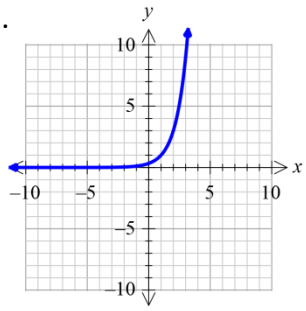

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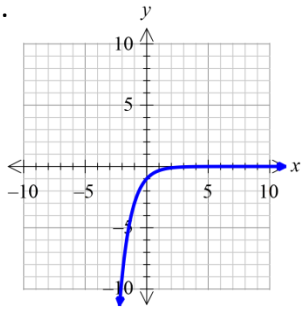

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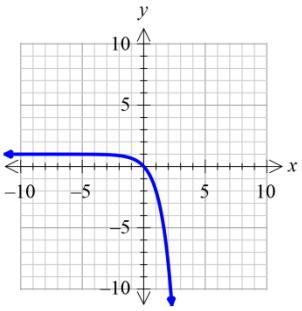

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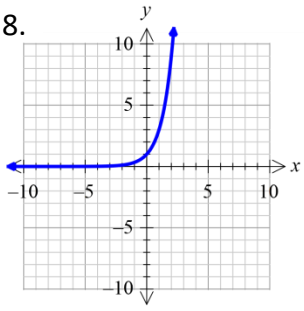

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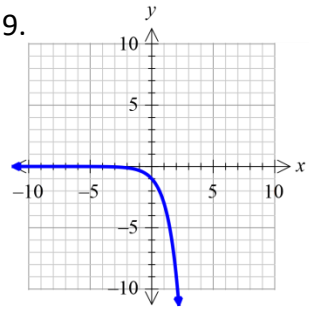

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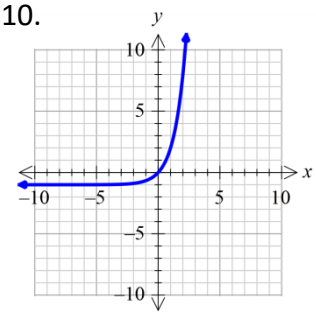

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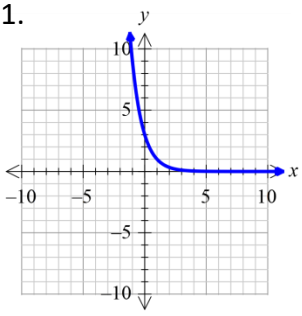


Use transformations and 3 key points to graph each function. Determine the domain, range, and horizontal asymptote of each function. Use a table! No Graphing Calculator! Show work!

12. $f(x)=2^x+1$

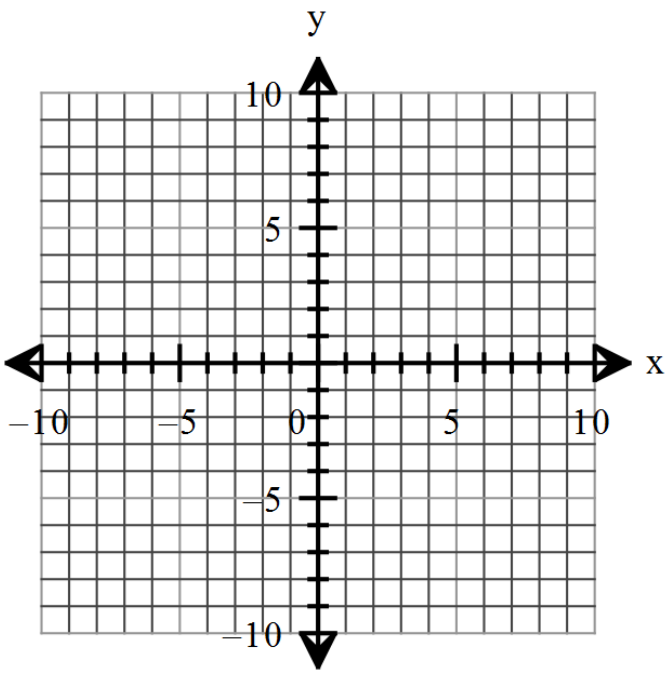
Domain: _____

Asymptotes:_____

Key points and transformations:

x	$f(x)$

x	$f(x)$



Range: _____

13. $f(x)=-3^{x-1}$

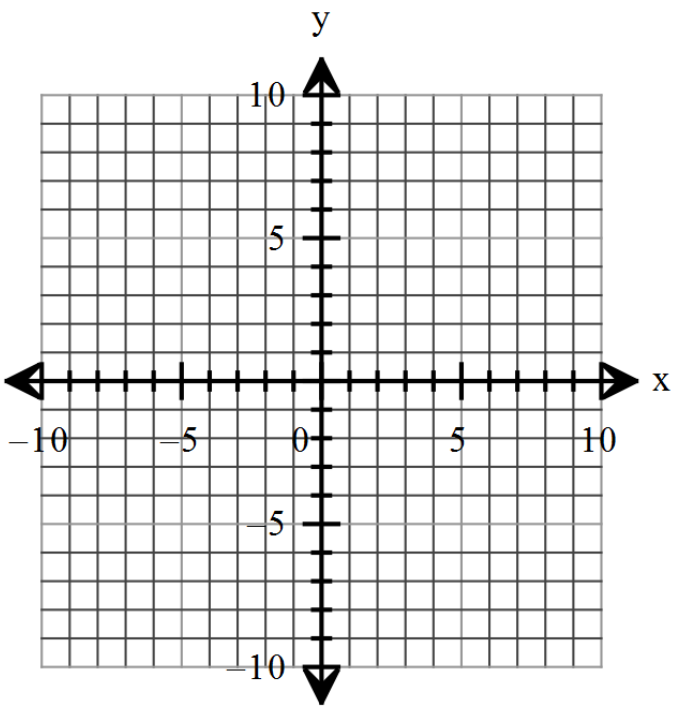
Domain: _____

Asymptotes:_____

Key points and transformations:

x	$f(x)$

x	$f(x)$



Range: _____

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

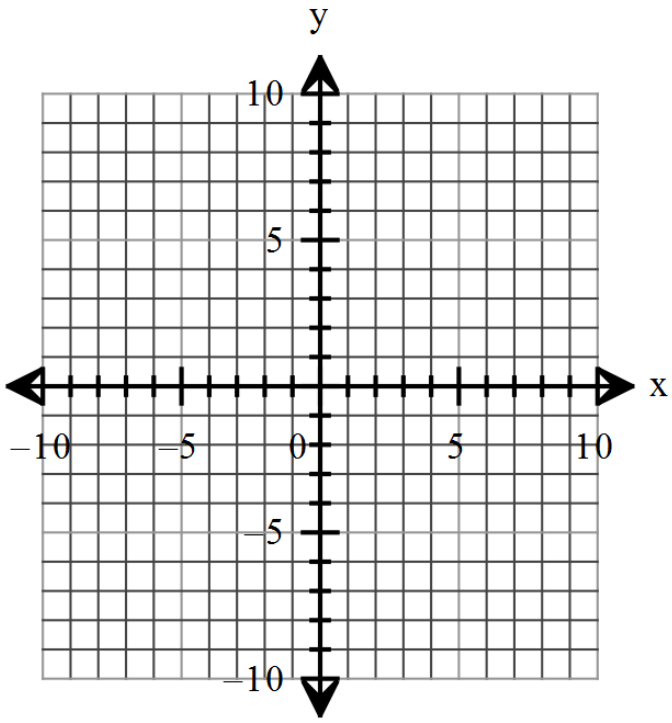
Domain: _____

Asymptotes:_____

Key points and transformations:

x	$f(x)$

x	$f(x)$



Range: _____

15. $f(x)=2^{-x}-3$

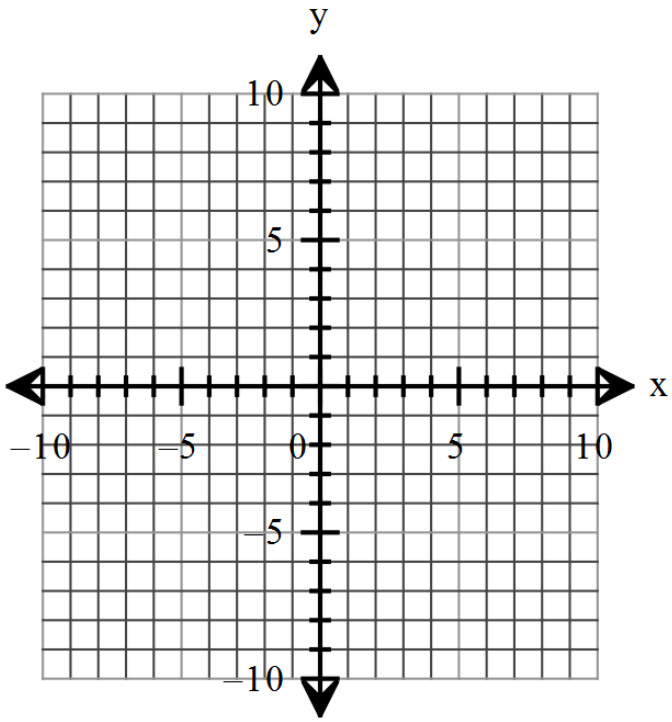
Domain: _____

Asymptotes:_____

Key points and transformations:

x	$f(x)$

x	$f(x)$



Range: _____

Review Exercises

Solve each equation using the one-to-one property for exponents. Show work! You may need to factor to solve.

16. $7^x = 7^3$

17. $\left(\frac{1}{4}\right)^x = \frac{1}{64}$

18. $3^{-x} = 81$

19. $4^{x^2} = 2^x$

20. $9^{-x+15} = 27^x$

21. $4^x \cdot 2^{x^2} = 16^2$

Find the domain of the given functions. Write answers in interval notation. Show work!

22. $f(x) = x^2 + 2$

23. $f(x) = \sqrt{-2x+7}$