ALBERT

Name _____ Date _____

Graphing Exponential Functions Worksheet

Algebra 1 · Common Core HSF-IF.C.7e

> Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.

Practice

Builds the skill step by step.

1. What is the y-intercept of $f(x) = 2^x$?

2. What is the y-intercept of $f(x) = 3 \cdot 2^x$?

3. Is $f(x) = (\frac{1}{2})^x$ increasing or decreasing?

   A. decreasing

   B. increasing

   C. constant

   D. neither

4. $f(x) = 2^x$. What is $f(3)$?

5. What is the horizontal asymptote of $f(x) = 2^x$?

   A. $y = 1$

   B. $y = 2$

   C. $x = 0$

   D. $y = 0$

6. $f(x) = 5(0.5)^x$. What is $f(2)$?

7. As x increases, what happens to 3^x?

   A. It approaches 0.

   B. It stays the same.

   C. It increases without bound.

   D. It approaches 3.

8. What is the y-intercept of $f(x) = 2^x + 1$?

9. $f(x) = 4^x$. What is $f(-1)$?

10. Which function shows exponential growth?

    A. $f(x) = 0.9^x$

    B. $f(x) = 1.5^x$

    C. $f(x) = (1/3)^x$

    D. $f(x) = 0.5^x$

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On Level

Grade-level practice.

1. $f(x) = 2^x - 3$ has a horizontal asymptote $y = c$. What is c?

2. What is the y-intercept of $f(x) = 2^x - 3$?

3. $f(x) = 100(0.8)^x$. What is f(2)?

4. As x decreases toward negative infinity, what happens to 3^x?

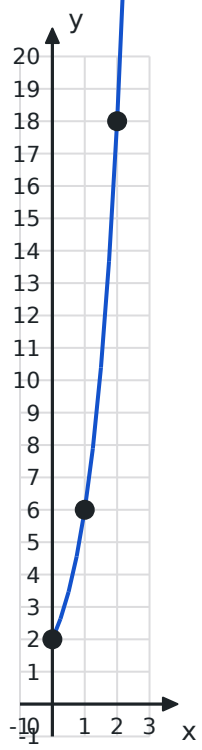
   A. It becomes negative.

   B. It approaches 0.

   C. It approaches 3.

   D. It decreases without bound.

5. The graph shows $f(x) = a \cdot b^x$. What is b?



6. Describe the end behavior of $f(x) = 2 \cdot 3^x$ and give its y-intercept.

7. $f(x) = a \cdot 2^x$ passes through (3, 40). What is a?

8. $g(x) = 2^x + 4$ is the graph of $f(x) = 2^x$ shifted up how many units?

9. Which function has no x-intercept?

   A. $f(x) = 2^x - 4$

   B. $f(x) = x - 2$

   C. $f(x) = 2^x$

   D. $f(x) = x^2 - 4$

10. $f(x) = (\frac{1}{3})^x$. What is $f(-2)$?

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Challenge

Multi-step and word problems that stretch it.

1. What is the x-intercept of $f(x) = 2^x - 8$?

2. What is the y-intercept of $f(x) = -2^x + 4$?

3. $f(x) = a \cdot b^x$ passes through (0, 5) and (2, 45). What is b?

4. What is the y-intercept of $f(x) = 3^{x-1}$?

5. $g(x) = 2^{x+2}$. What is g(0)?

6. What is the range of $f(x) = 2^x + 1$?

   A. all y greater than 1

   B. all y greater than 0

   C. all real numbers

   D. all $y \geq 2$

7. What is the smallest whole number x for which 2^x is more than 1,000?

8. Compare the graphs of $f(x) = 2^x$ and $g(x) = (\frac{1}{2})^x$.

9. $f(x) = 10(0.5)^x$. For what x is $f(x) = 0.625$?

10. Which table shows an exponential function?

    A. x: 0, 1, 2, 3 and y: 3, 6, 12, 24

    B. x: 0, 1, 2, 3 and y: 3, 6, 9, 12

    C. x: 0, 1, 2, 3 and y: 0, 1, 4, 9

    D. x: 0, 1, 2, 3 and y: 5, 5, 5, 5