4.2 WS 3

Evaluate the exponential function for the given *x* values.

1. $f(x)=4^x$ a. $x=-5$ b. $x=3$

2. $g(x)=11^x$ a. $x=2$ b. $x=-3$

3. $f(x)=\left(\frac{1}{5}\right)^x$ a. $x=-3$ b. $x=4$

4. $g(x)=\left(\frac{3}{4}\right)^x$ a. $x=-2$ b. $x=4$

Use a calculator to evaluate the exponential function for the given *x* value. Round to the nearest hundredth.

5. $f(x)=4^x;\ x=3.7$

6. $h(x)=e^x;\ x=\sqrt{8}$

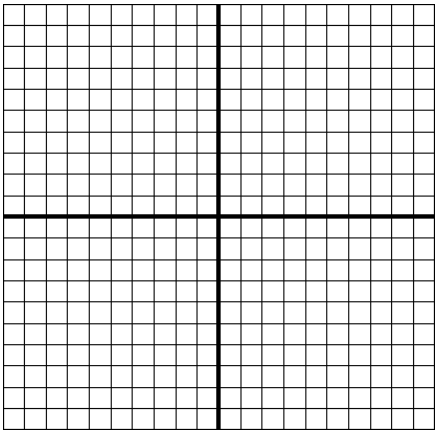
7. $g(x)=8.6^x;\ x=-4$

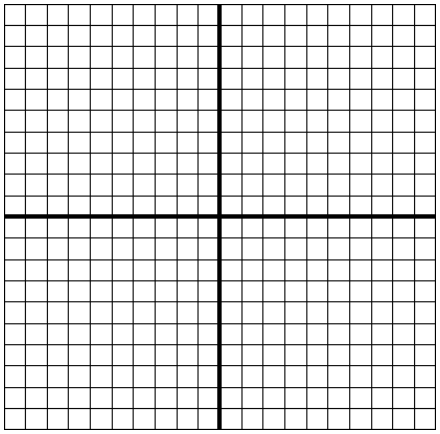
Sketch the graph of each function.

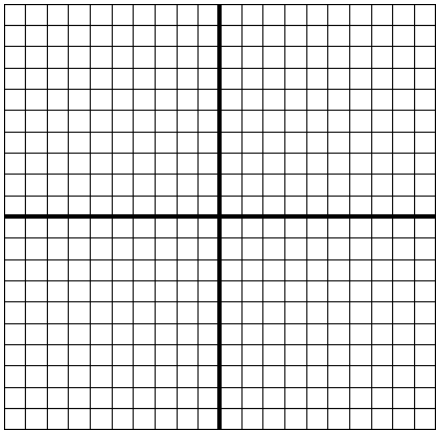
8. $f(x)=4^x$

9. $g(x)=\left(\frac{1}{3}\right)^x$

10. $h(x)=7^x$







Explain how to use the graph of the first function *f* to produce the graph of the second function *F*.

11. $f(x)=2^x; F(x)=2^x-6$

12. $f(x)=4^x; F(x)=4^{x-4}-2$

13. $f(x)=(3)^x; F(x)=2(3)^x$

14. $f(x)=\left(\frac{1}{3}\right)^x; F(x)=\left(\frac{1}{3}\right)^{x+5}+3$

15. Lead shielding is used to contain radiation. The percentage of certain radiation that can penetrate x millimeters of lead shielding is given by $I(x) = 100e^{-1.5x}$.

a. What percentage of radiation, to the nearest tenth of a percent, will penetrate a lead shield that is 1 millimeter thick?

b. How many millimeters of lead shielding are required so that less than 0.05% of the radiation penetrates the shielding? Round to the nearest millimeter.

16. The number of bass in a lake is given by $P(t) = \dfrac{3600}{1+7e^{-0.05t}}$ where t is the number of months that have passed since the lake was stocked with bass.

a. How many bass were in the lake immediately after it was stocked?

b. How many bass were in the lake 1 year after the lake was stocked? Round to the nearest bass.

c. What will happen to the bass population as t increases without bound?

Use the composition of functions to determine whether f and g are inverses of one another.

17. $f(x) = \dfrac{1}{2}x - \dfrac{1}{2};\ g(x) = -2x + 1$

18. $f(x) = \dfrac{2x}{x-3};\ g(x) = \dfrac{x}{x-2}$

Find the inverse of each function, then state the domain and range of $f^{-1}(x)$.

19. $f(x) = \sqrt{3x-6}$

20. $f(x) = \dfrac{x+2}{9-x}$

21. $f(x) = \sqrt[3]{x-5}$