

CH-5 Assignment

Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. Which function results when the graph of the function $y = 9^x$ is reflected in the y-axis, compressed vertically by a factor of $\frac{1}{5}$, and shifted 6 units down?

A $y = \frac{1}{5}(9)^{-x} + 6$

C $y = \frac{1}{5}(9)^x + 6$

B $y = \frac{1}{5}(9)^x - 6$

D $y = \frac{1}{5}(9)^{-x} - 6$

2. A bacteria colony initially has 3500 cells and doubles every week. Which function can be used to model the population, p , of the colony after t days?

A $p(t) = 3500(3)^{\frac{t}{7}}$

C $p(t) = 3500(2)^t$

B $p(t) = 3500(2)^{\frac{t}{7}}$

D $p(t) = 3500(3)^t$

3. Which of the following represents $a = \log_8 512$?

A $8^a = 512$

C $a^8 = 512$

B $a^{512} = 8$

D $8^{512} = a$

4. The domain of the function $f(x) = -6\log_7[7(x+4)] - 6$ is

A $\{x|x < -4, x \in \mathbf{R}\}$

C $\{x|x > -4, x \in \mathbf{R}\}$

B $\{x|x < -6, x \in \mathbf{R}\}$

D $\{x|x > -6, x \in \mathbf{R}\}$

5. What is the solution of the equation $7(5^{x+2}) = 1225$?

A $x = \frac{\log 175}{\log 5}$

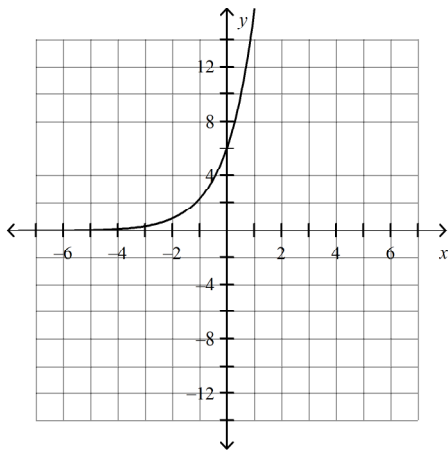
C $x = \frac{\log 1225}{\log 35}$

B $x = \log \frac{175}{2}$

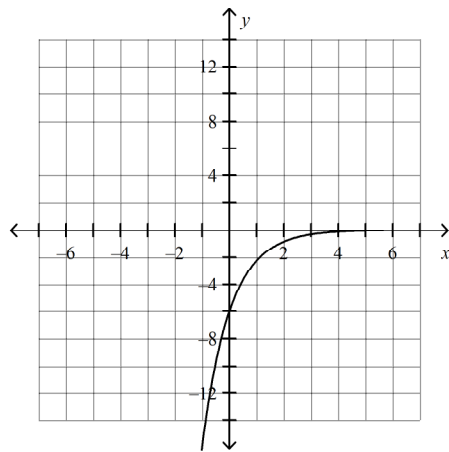
D $x = \frac{\log 7}{\log 5}$

6. Which graph represents the function $y = 6\left(\frac{3}{8}\right)^x$?

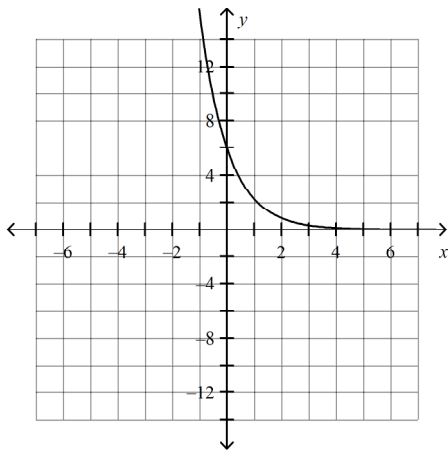
A



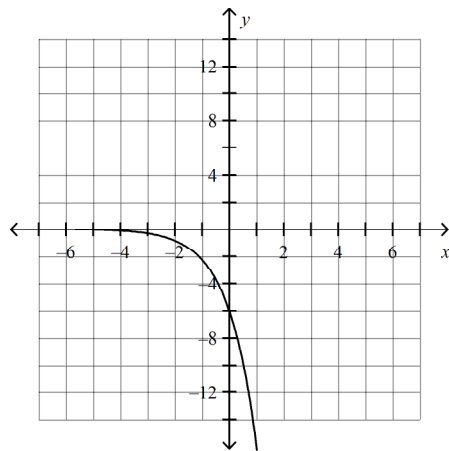
C



B



D



7. Compared to the graph of the base function $f(x) = \log_9 x$, the graph of the function $g(x) = 6\log_9[-5(x - 6)] - 4$ is

A translated up 4 units and right 6 units,
horizontally stretched by a factor of $\frac{1}{5}$,
reflected in the y-axis, vertically
stretched by a factor of 6, and
not reflected in the x-axis

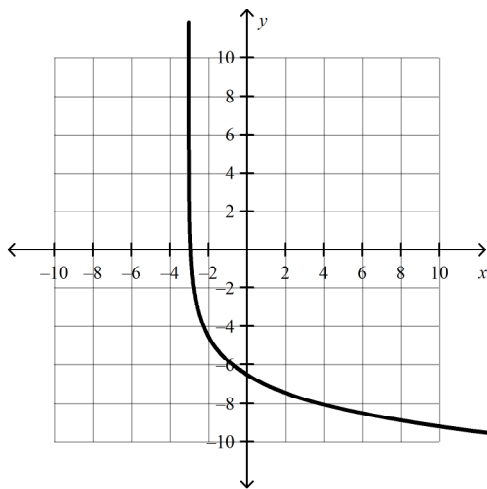
C translated down 4 units and left 6 units,
horizontally stretched by a factor of $\frac{1}{5}$,
not reflected in the y-axis, vertically
stretched by a factor of 6, and
not reflected in the x-axis

B translated down 4 units and right 6 units,
horizontally stretched by a factor of $\frac{1}{5}$,
reflected in the y-axis, vertically
stretched by a factor of 6, and
not reflected in the x-axis

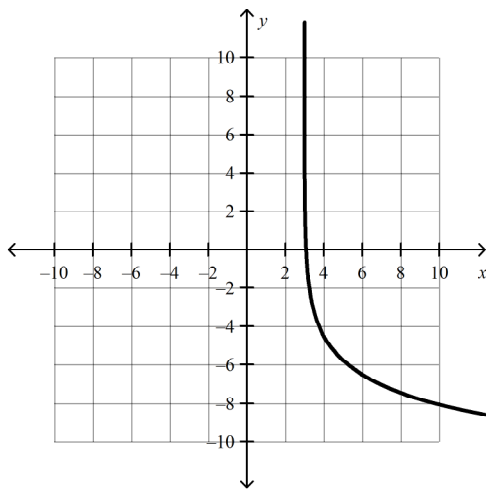
D translated down 4 units and right 6 units,
horizontally stretched by a factor of $\frac{1}{5}$,
not reflected in the y-axis, vertically
stretched by a factor of 6, and
not reflected in the x-axis

8. Which graph represents the function $y = -2\log_3[4(x+3)] - 2$?

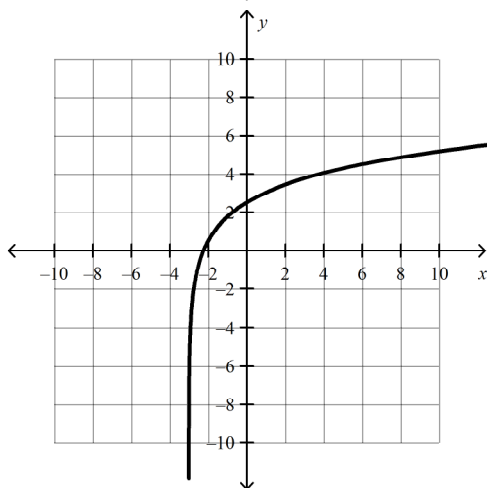
A



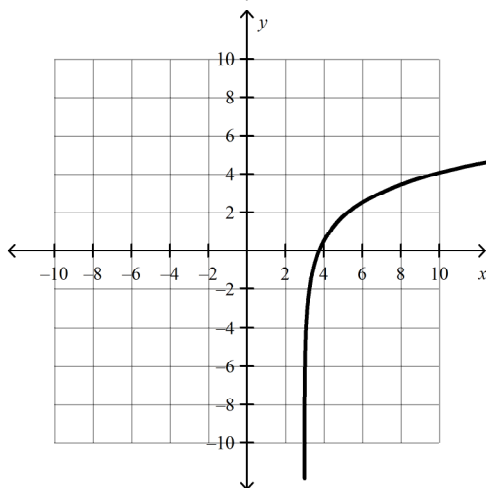
C



B



D



9. Which of the following is equivalent to the expression $\log_7 sw^9y$?

A $9\log_7 s + \log_7 w + \log_7 y$

C $\log_7 s + \log_7 w + 9\log_7 y$

B $9\log_7 s - 9\log_7 w + \log_7 y$

D $\log_7 s + 9\log_7 w + \log_7 y$

10. The pH scale measures the acidity or alkalinity of a solution. A solution that has a pH of 7 is neutral. For each increase of 1 pH, a solution is 10 times as alkaline. For each decrease of 1 pH, a solution is 10 times as acidic.

A sample of soap has a pH of 9.1. A sample of household ammonia has a pH of 11.3.
To the nearest whole number, how many times as alkaline as the soap is the ammonia?

A 2 times as alkaline

C 12 times as alkaline

B 158 times as alkaline

D 72 times as alkaline

Short Answer (Write the Final Answer on the Response Form)

11. Solve: $81 = 9^{x+4}$

12. Solve: $\left(\frac{1}{36}\right)^{x-1} = \left(\sqrt{216}\right)^x$

13. Solve: $343^x = 7^{(x^2-4)}$

14. Write as a single logarithm: $\frac{2}{5}\log_6 x - 9\log_6 y - 8\log_6 z$

15. Evaluate: $\log_5 16 - 6\log_5 4 + 4\log_5 20$

16. Write as a single logarithm: $3\log_5 4 - \log_5 20 + 2$

17. Given $\log n \doteq 1.462$, determine the approximate value of $\log(100n^5)$.

18. Solve: $112 = 4\left(7^{x+1}\right)$. Give the solution to the nearest hundredth.

19. Solve: $\log_4(2x+18) - \log_4(x+9) = \log_4(x-5)$

20. Solve: $\log_6 x + \log_6(x+19) = 3$

Open-Ended Responses (Show all work on the Response Form)

21. Cobalt-60, which has a half-life of 5.3 years, is used in medical radiology. A sample of 60 mg of the material is present today. How many years will it take for the amount of cobalt-60 to decay to 12.5% of its initial amount?
22. Jeff buys a new vehicle for \$35 000. It is known that the vehicle will depreciate by 20% of its current value every year. Approximately how long will it take the vehicle to depreciate to \$3000?
23. Solve the equation algebraically: $\log \sqrt[3]{x^2 + 48x} = \frac{2}{3}$.