

Section 7.2 Extra Practice

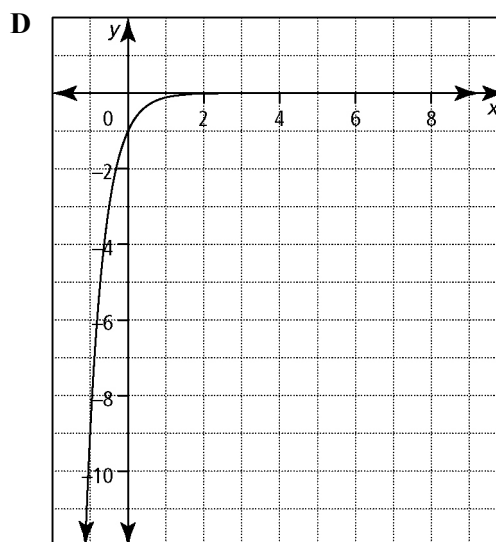
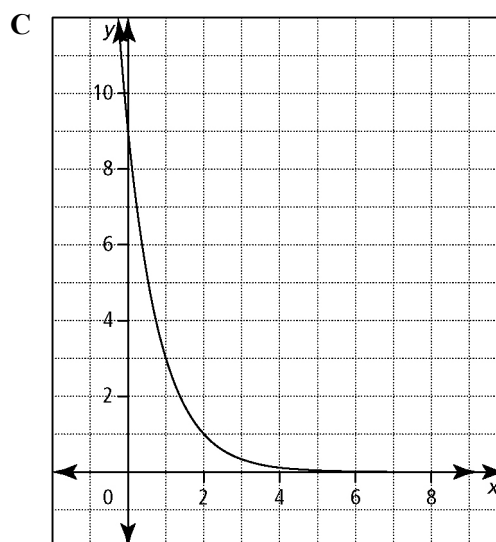
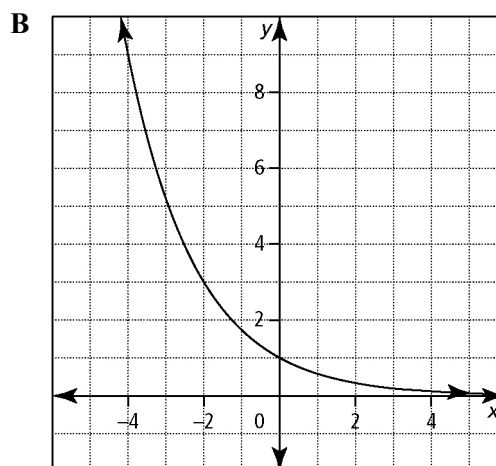
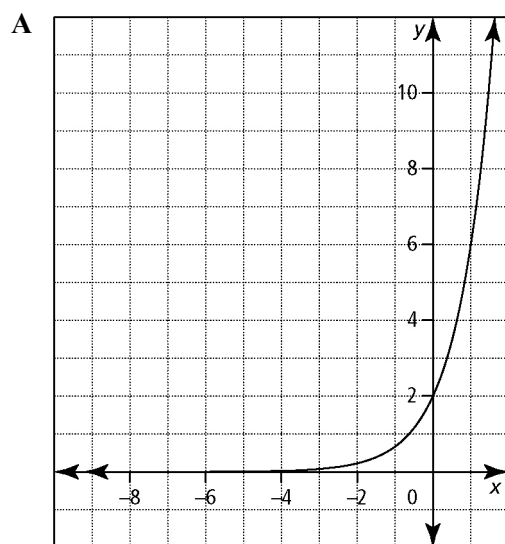
1. Match each function with the corresponding transformation of $y = 4^x$.

- a) $y = -4^x$
 b) $y = 4^{-x}$
 c) $y = 4^x - 2$
 d) $y = 4^{x-2}$

- A reflection in the x -axis
 B reflection in the y -axis
 C vertical stretch
 D horizontal stretch
 E translation down
 F translation up
 G translation left
 H translation right

2. Without using technology, match each function with the corresponding graph.

- a) $y = \left(\frac{1}{3}\right)^{x-2}$
 b) $y = 2\left(\frac{1}{3}\right)^{-x}$
 c) $y = -\left(\frac{1}{3}\right)^{2x}$
 d) $y = \left(\frac{1}{3}\right)^{\frac{1}{2}x}$



3. The graph of $y = 5^x$ is transformed to obtain the graph of $y = -\frac{1}{2}(5)^{x+4} - 6$. Copy and complete the following table to show the progression of the transformation.

$y = 5^x$	$y = -5^x$	$y = -\frac{1}{2}(5)^x$	$y = -\frac{1}{2}(5)^{x+4} - 6$
$(-2, \frac{1}{25})$			
$(-1, \frac{1}{5})$			
$(0, 1)$			
$(1, 5)$			
$(2, 25)$			

4. For each function, state the parameters a , b , h , and k . Describe the transformation that corresponds to each parameter.
- $f(x) = 4(2)^x + 6$
 - $g(x) = -(0.3)^{x-4}$
 - $h(x) = \frac{3(5)^{4(x-9)}}{2} - 8$
 - $k(x) = \frac{1}{2}\left(\frac{1}{3}\right)^{-\frac{4}{5}(x+2)} + \frac{7}{4}$
5. Sketch each of the following functions, without using technology. Identify the corresponding y -value for each given value of x .
- $y = (4)^{0.5(x-1)} + 7$; $x = 1, x = 3, x = 5$
 - $y = -3(2)^{2(x+5)}$; $x = -5, x = -4.5, x = -4$
 - $y = \frac{1}{2}(3)^{x-6} - 5$; $x = 6, x = 7, x = 8$
6. Write each transformed function in the form $y = a(c)^{b(x-h)} + k$.
- $f(x) = (0.5)^x$ after it has been vertically stretched by a factor of 3, reflected over the y -axis, and translated 4 units left and 3 units down
 - $g(x) = 3^x$ after it has been horizontally stretched by a factor of one half, reflected over the x -axis, and translated 7 units up
 - $h(x) = 2^x, y = -4h(2(x-3)) + 5$
 - $k(x) = \left(\frac{1}{5}\right)^x, y = \frac{k(x+1)}{3}$
7. For each of the following exponential functions, state the
- domain and range
 - equation of the horizontal asymptote
 - x -intercept and y -intercept
- $f(x) = -6(3)^x + 2$
 - $g(x) = 0.5(4)^{-2x} - 4$
 - $h(x) = 2\left(\frac{1}{3}\right)^{-x}$
8.
 - Given the function $y = 3^x$, list the parameters of the transformed exponential function $y = 0.5(3)^{-2(x+4)} + 7$.
 - Describe how each parameter in part a) transforms the graph of the original function, $y = 3^x$.
 - The following points lie on the graph of $y = 3^x$: $(0, 1), (1, 3), (2, 9)$. Write the transformed point that corresponds to each for the function $y = 0.5(3)^{-2(x+4)} + 7$.
9. The estimated population of a city in 2011 was 35 000, with an annual rate of increase of about 2.4%.
- What is the growth factor for this city?
 - Graph the population growth of this city from 2011 until 2021.
 - Use your graph to estimate the population in 2016.
10. The pressure of Earth's atmosphere is 14.7 lb/in.^2 at sea level. That pressure decreases by about 20% for each mile of ascent up to an altitude of about 50 miles.
- Graph this situation up to 10 mi.
 - Estimate the pressure at an altitude of 5 mi to the nearest pound per square inch.

