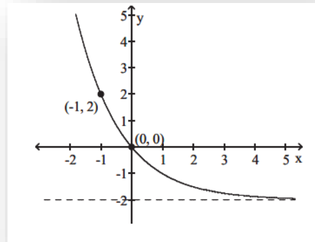
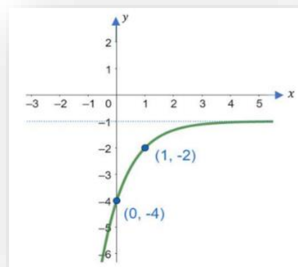
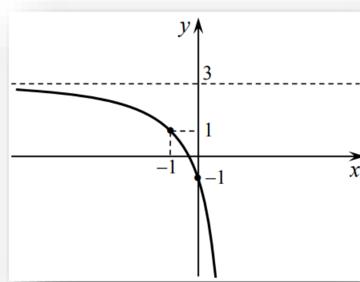
4.1: (Exponential Functions and The Natural Exponential)

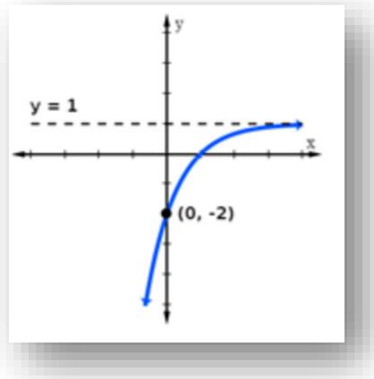
If the two points $(-2,1)$ and $(2,81)$ lie on the graph of the exponential function $y = b^{x+c}$, then $b + c =$ A) 3 B) 6 C) 5 D) -2 E) 0	Exponential Functions.
The range of the function $f(x) = 1 + e^{-\|x-2\|}$ is A) $(2,\infty)$ B) (0,2] C) $(1,\infty)$ D) (1,2] E) $(-\infty,2]$	Exponential Functions.
If $f(x) = a^x$ and $f(-1) = \frac{1}{2}$, then $f^{-1}(16) =$ A) 4 B) 2 C) $\frac{1}{4}$ D) 8 E) -2	Exponential Functions.

If $f(x) = a^{2x-3}$ and $f\left(\frac{1}{2}\right) = \frac{1}{4}$, then $f^{-1}(32) =$ A) 2 B) 4 C) -2 D) -4 E) $\frac{5}{2}$	Exponential Functions.
The range of the function $f(x) = 2 - \left(\frac{1}{3}\right)^{x-1}$ is A) $(2, \infty)$ B) $(-3, \infty)$ C) $(-\infty, 2)$ D) $(-\infty, 0)$ E) $(-\infty, 3)$	Exponential Functions.
If $f(x) = -\left(\frac{1}{3}\right)^{x+2} + 3$, then $f^{-1}(2)$ is equal to: (a) -2 (b) 1 (c) 3 (d) 0 (e) -1	Exponential Functions.
If $f(x) = 2 + e^{(x-3)}$, then the domain of f^{-1} is A) $(3, \infty)$ B) $(2, \infty)$ C) $(-\infty, 2)$ D) $[2, \infty)$ E) $(-\infty, 3)$	Exponential Functions.

Let $f(x) = a - 2^{bx}$, If $f^{-1}(0) = 0$ and $f^{-1}(-3) = -1$, then $a + b =$ A) -1 B) 0 C) -2 D) 1 E) 2	Inverse of exponential functions.
If $f(x) = -\left(\frac{1}{2}\right)^{2-x} + 2$, then the domain of the inverse function f^{-1} is A) $(-\infty, 2)$ B) $[2, \infty)$ C) $(-\infty, \infty)$ D) $(2, \infty)$ E) $(-\infty, 2]$	Exponential Functions (Range of f is Domain of f^{-1}).
The graph of $f(x) = 1 - 2^{x+1}$ is below the x-axis on the interval A) $(-1, \infty)$ B) $(1, \infty)$ C) $(-\infty, \infty)$ D) $(-\infty, -1)$ E) $(-\infty, 1)$	Exponential Functions.
The graph of the function $y = 1 - \left(\frac{1}{2}\right)^{2-x}$ lies below the x-axis on the interval A) $(2, \infty)$ B) $(-\infty, 2)$ C) $(-\infty, 1)$ D) $(1, \infty)$ E) $(1,2)$	Exponential Functions.

If the function $f(x) = 2^{(ax+b)} + c$ represents the graph below, then $a + b + c =$  A) -2 B) -1 C) 0 D) 2 E) 1	Exponential Functions.
The equation of the adjacent graph is  A) $y = -3^{1-x} - 1$ B) $y = -3^{x+1} - 1$ C) $y = 3^{x-1} - 1$ D) $y = -\left(\frac{1}{3}\right)^{1-x} - 1$ E) $y = 3^{1+x} - 1$	Exponential Functions.
If $y = -\left(\frac{1}{2}\right)^{ax+b} + 3$ is the function of the graph below, then $a + b =$  A) -3 B) -1 C) 1 D) 2 E) -2	Exponential Functions.
If $f(x) = a^x$ is an exponential function and $f^{-1}\left(\frac{1}{9}\right) = -2$, then $f(4) =$ A) 81 B) 27 C) 16 D) $\frac{1}{3}$ E) $\frac{1}{16}$	Exponential Functions.

<table>
<tr><td>The equation of the adjacent graph is

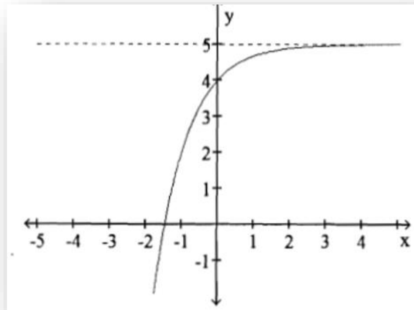
A) $y = -\left(\frac{1}{3}\right)^{x-1} + 1$
B) $y = -\left(\frac{1}{3}\right)^{x+1} + 1$
C) $y = -\left(\frac{1}{3}\right)^{x-1} - 1$
D) $y = -\left(\frac{1}{3}\right)^{x+1} - 1$
E) $y = -\left(\frac{1}{3}\right)^{1-x} + 1$

</td><td>Exponential Functions.</td></tr>
<tr><td>Which one of the following statements is FALSE about the graph of the function $f(x) = \left(\frac{1}{3}\right)^{-x+1} - 9$

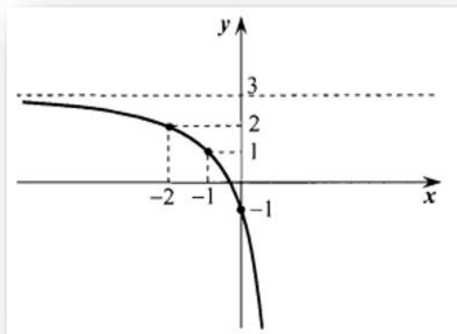
A) The x-intercept is -1
B) The y-intercept is $-\frac{26}{3}$
C) The graph of f increases on the interval $(-\infty, \infty)$
D) The graph of f has a horizontal asymptote $y = -9$
E) The range of f is $(-9, \infty)$</td><td>Exponential Functions.</td></tr>
<tr><td>If $f(x) = a^x$ and the graph of f passes through the point $(-3,64)$, then $f\left(\frac{5}{2}\right) =$

A) $\frac{1}{32}$
B) $\frac{1}{16}$
C) -16
D) -32
E) $\frac{1}{243}$</td><td>Exponential Functions.</td></tr>
</table>

The range of the function $f(x) = 3 + 2^{-\|x\|}$ is A) (3,4] B) $[3, \infty)$ C) $(-\infty, 3]$ D) $(-3,2]$ E) (0,3)	Exponential Functions.
If $f(x) = 3^{k-x}$ and $f(-3) = 3$, then $f(2) =$ A) $\frac{1}{32}$ B) $\frac{1}{9}$ C) $\frac{1}{3}$ D) $\frac{1}{81}$ E) $\frac{1}{27}$	Exponential Functions.
If $g(x) = \left[\frac{1}{3}\right]^{3-x} - 27$, then which one of the following statements is TRUE? A) x-intercept of g is 6. B) g is a decreasing function. C) Range of g is $(27, \infty)$ D) the line of $y = 27$ is a horizontal asymptote of g. E) domain of g is $(3, \infty)$	Exponential Functions.

If $f(x) = a^x, a > 0$ and $a \neq 1$, then $\frac{f(x+2)}{f(x+1)} + \frac{2f(x+1)}{f(x)}$ is equal to: A) $3a$ B) $2a$ C) $3a^x$ D) 3 E) $3a^{x+1}$	Exponential Functions.
Which one of the following statements is TRUE about the function $f(x) = \left(\frac{1}{2}\right)^{1-x} - 1$? A) The range of f is $(-1, \infty)$. B) The x-intercept of f is -1. C) f is decreasing on $(-\infty, \infty)$. D) The domain of f is $(-\infty, 1)$. E) The y-intercept of f is -1.	Exponential Functions.
If $(a, 0)$ is the x-intercept and $(0, b)$ is the y-intercept of the function $f(x) = -2^{-x+2} + 8$, then $b - a =$ A) 5 B) 0 C) -3 D) 3 E) -4	Exponential Functions.
If $f(x) = 2^{3-x}$ is written in the form $f(x) = k\mathrm{a}^x$, then A) $k = 8, a = \frac{1}{2}$ B) $k = 9, a = \frac{1}{2}$ C) $k = 2, a = \frac{1}{8}$ D) $k = 8, a = -\frac{1}{2}$ E) $k = 8, a = -2$	Exponential Functions.

The adjacent figure represents the graph of: A) $5-3^{-x}$ B) $5+3^{-x}$ C) $-3+5^{x}$ D) $5-3^{x}$ E) $3+5^{x}$ 	Exponential Functions.
Let $f(x)=a^{x}$ be an exponential function. If $f(5/2)=4\sqrt{2}$ and $f(-3)=k$ then $a+k=$ (A)) $\frac{17}{8}$ B) $\frac{8}{17}$ C) $\frac{17}{2}$ D) $\frac{2}{17}$ E) $\frac{65}{32}$	Exponential Functions.
If $a>0, a\neq 1$, which one of the following statements is TRUE? A) The base of the exponential function $f(x)=a^{x}$ whose graph contains the point $\left(-4,\frac{1}{16}\right)$ is 2 . B) The range of $f(x)=a^{x}$ is $[0,\infty)$. C) The graph of $f(x)=a^{x+2}$ has $x=2$ as a vertical asymptote. D) The graph of the exponential function $y=a^{x}$ is the same as the graph of $y=-\left(\frac{1}{a}\right)^{x}$. E) The domain of $f(x)=a^{x}$ is $(0,\infty)$.	Exponential Functions.

If $f(x) = \left(\frac{1}{2}\right)^{1-2x}$, then $f(x)$ can be written as (a) $f(x) = \left(\frac{1}{2}\right) 4^{x}$ (b) $f(x) = \left(\frac{1}{2}\right) 4^{-x}$ (c) $f(x) = \left(\frac{1}{4}\right) 2^{x}$ (d) $f(x) = \left(\frac{1}{4}\right) 2^{-4}$ (e) $f(x) = \left(\frac{1}{2}\right) 2^{x}$	Exponential Functions.
The adjacent graph represents the function A) $y = -2^{x+2} + 3$ B) $y = -2^{2-x} + 3$ C) $y = 2^{-x} - 3$ D) $y = 2^{x+1} - 3$ E) $y = -2^{-x} + 5$  	Exponential Functions.
Which one of the following statements is false about the function $f(x) = -2^{x-1} + 4$? A) the graph of f has an x-intercept 3 and y-intercept 3 B) f is a decreasing function over the interval $(-\infty, \infty)$ C) the range of f is $(-\infty, 4)$ D) the horizontal asymptote of the graph of f is $y = 4$ E) the graph of f is above the x-axis on the interval $(-\infty, 3)$	Exponential Functions.

Let $(a, 0)$ and $(0, b)$ be the x - and y-intercepts of the graph of $y = -4 + \left(\frac{1}{2}\right)^{x-3}$ then $a + b =$ A) $\frac{11}{4}$ B) 5 C) -3 D) -6 E) 9	Exponential Functions.
Which of the following statements is NOT TRUE about the function $f(x) = -\left(\frac{1}{8}\right)^{x}$? A) f is a one-to-one function. B) The graph of f is asymptotic to the negative x-axis. C) The domain of f is $(-\infty, \infty)$. D) The function f is increasing on $(-\infty, \infty)$. E) The graph of f passes through the point $(0, -1)$.	Exponential Functions.
The graph of $y = 2^{4-x} - 4$ A) is below the x-axis on the interval $(2, \infty)$ B) is increasing on the interval $(-\infty, \infty)$ C) has an x-intercept at $(12,0)$ D) is decreasing on the interval $(0, \infty)$ only E) has a horizontal asymptote $y = 0$	Exponential Functions.

If $f(x) = \left(\frac{2}{3}\right)^{2-3x}$ is written as $f(x) = ka^x$, then $8a - 27k =$ A) 15 B) 39 C) 19 D) -15 E) -19	Exponential Functions.
Which one of the following statements is true for the function $f(x) = -\left(\frac{1}{5}\right)^{x-3} + 25$? A) The range is $(-\infty, 25)$ B) The x-intercept is -1 C) The y-intercept is -10 D) The graph of f is decreasing E) The graph of f has horizontal asymptote $y = -25$	Exponential Functions.
If the points (3,4) and (4,16) lie on the graph of $f(x) = b^{x+3c}$, then $f(2) =$ A) 1 B) -2 C) 6 D) 7 E) -6	Exponential Functions.

The graph of the function $y = 3\left(\frac{1}{3}\right)^{1-x} - 1$ is below the x-axis on the interval A) $(-\infty, 0)$ B) $(0, \infty)$ C) $(-\infty, 1)$ D) $(1, \infty)$ E) $(0,1)$	Exponential Functions.
The graph of the function $y = \lvert e^{-x} - 1\rvert$ is increasing on the interval A) $(0, \infty)$ B) $(-\infty, 0)$ C) $(-\infty, 1)$ D) $(-1, \infty)$ E) $(-\infty, \infty)$	Exponential Functions.
Which one of the following statements is TRUE about $f(x) = 1 - 2^{-\lvert x\rvert}$? A) the range of $f(x)$ is $[0,1)$ B) the range of $f(x)$ is $(-1,0]$ C) the graph of $f(x)$ is increasing on $(-\infty, 0)$ D) the graph of $f(x)$ is decreasing on $(0, \infty)$ E) the line $y = -1$ is an asymptote to the graph of $f(x)$	Exponential Functions.
If the graph of the function $f(x) = 1 + \lvert 2^x - b\rvert$, where $b > 0$, has a horizontal asymptote at $y = 3$, then $b + 1 =$ (a) 3 (b) 2 (c) 4 (d) 5 (e) 1	Exponential Functions.