

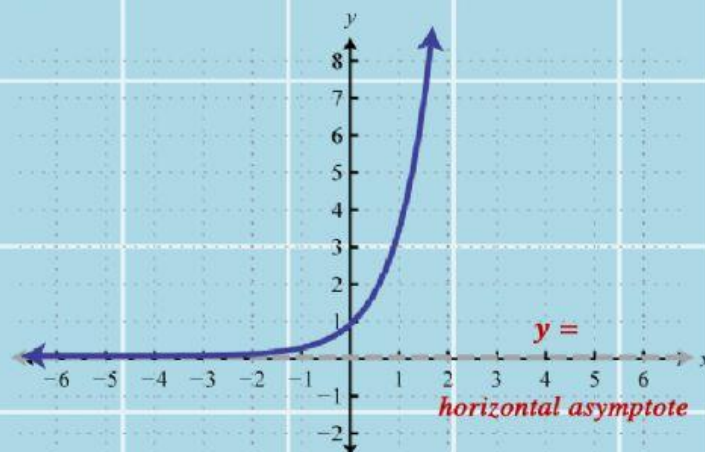
Name: _____

No. _____ M.4/ _____

Exponential Functions

1. $y = 4^x$

x	$y = 4^x$	<i>Solutions</i>
-3	$4^{-3} = \frac{1}{4^3} = \frac{1}{64} =$	(-3,)
-2	$4^{-2} = \frac{1}{4^2} = \frac{1}{16} =$	(-2,)
-1	$4^{-1} = \frac{1}{4^1} = \frac{1}{4} =$	(-1,)
0	$4^0 =$	(0,)
1	$4^1 =$	(1,)
2	$4^2 =$	(2,)
3	$4^3 =$	(3,)

 $(-\infty, \infty)$ $(0, \infty)$ *The horizontal asymptote is $y =$*

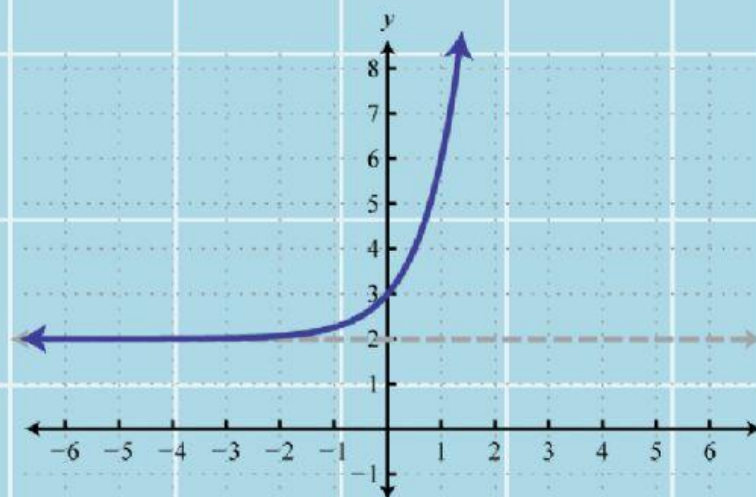
Domain:

Range:

2. $f(x) = 4^x + 2$

x	$y = 4^x + 2$	<i>Solutions</i>
-3	$4^{-3} = \frac{1}{4^3} = \frac{1}{64} = 0.015625 + 2$	(-3, 2.015625)
-2	$4^{-2} = \frac{1}{4^2} = \frac{1}{4} = \quad + 2$	()
-1	$4^{-1} = \frac{1}{4^1} = \frac{1}{4} = \quad$	()
0	$4^0 = \quad + 2$	()
1	$4^1 = \quad$	()
2	$4^2 = \quad$	()
3	$4^3 = \quad$	()

$(-\infty, \infty)$ $(2, \infty)$



The horizontal asymptote is $y =$

Domain:

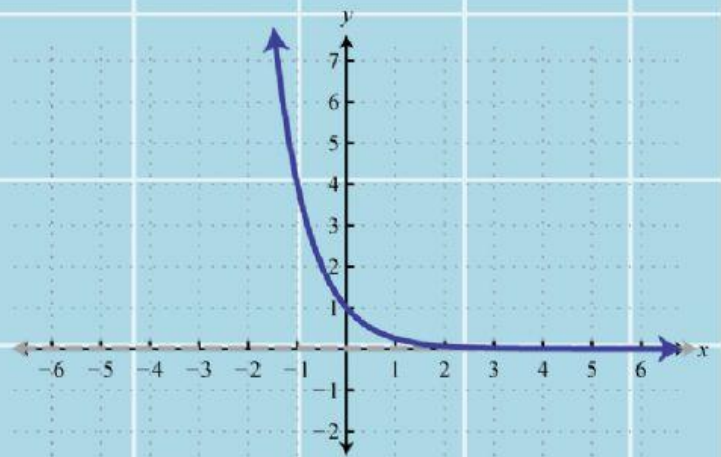
Range:

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

x	$y = \left(\frac{1}{4}\right)^x$	<i>Solutions</i>
-3	$\left(\frac{1}{4}\right)^{-3} = \frac{1}{\left(\frac{1}{4}\right)^3} = \frac{1}{\frac{1}{8}} = \frac{1}{1} \times \frac{8}{1} = 8$	(-3, 8)
-2	$\left(\frac{1}{4}\right)^{-2} = \frac{1}{\left(\frac{1}{4}\right)^2} = \frac{1}{\frac{1}{16}} = \frac{1}{1} \times \frac{16}{1} = 16$	(-2, 16)
-1	$\left(\frac{1}{4}\right)^{-1} = \frac{1}{\left(\frac{1}{4}\right)^1} = \frac{1}{\frac{1}{4}} = \frac{1}{1} \times \frac{4}{1} = 4$	(-1, 4)
0	$\left(\frac{1}{4}\right)^0 = 1$	(0, 1)
1	$\left(\frac{1}{4}\right)^1 = \frac{1}{4} = 0.25$	(1, 0.25)
2	$\left(\frac{1}{4}\right)^2 = \frac{1}{16}$	(2, 0.0625)
3	$\left(\frac{1}{4}\right)^3 = \frac{1}{64}$	(3, 0.015625)

$(-\infty, \infty)$

$(0, \infty)$



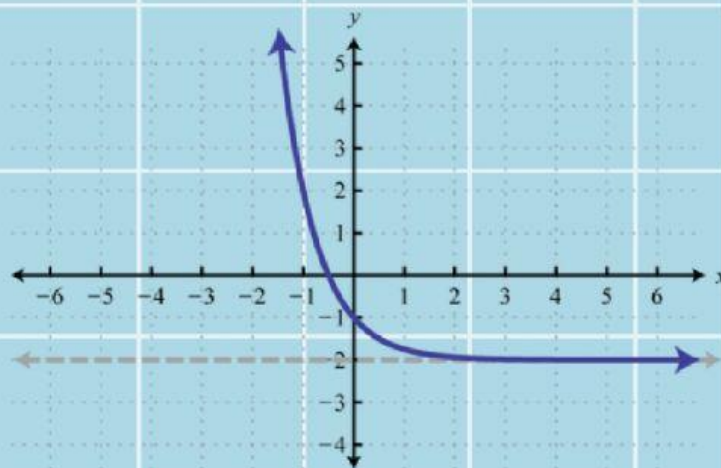
The horizontal asymptote is $y = 0$

Domain:

Range:

$$4. f(x) = \left(\frac{1}{4}\right)^x - 2$$

x	$y = \left(\frac{1}{4}\right)^x - 2$	<i>Solutions</i>
-3	$\left(\frac{1}{4}\right)^{-3} = \frac{1}{\left(\frac{1}{4}\right)^3} = \frac{1}{\frac{1}{8}} = \frac{1}{1} \times \frac{8}{1} = 8$ $8 - 2 = 6$	$(-3, 6)$
-2	$\left(\frac{1}{4}\right)^{-2} = \frac{1}{\left(\frac{1}{4}\right)^2} = \frac{1}{\frac{1}{16}} = \frac{1}{1} \times \frac{16}{1} = 16$ $16 - 2 = 14$	$(-2, 14)$
-1	$\left(\frac{1}{4}\right)^{-1} = \frac{1}{\left(\frac{1}{4}\right)^1} = \frac{1}{\frac{1}{4}} = \frac{1}{1} \times \frac{4}{1} = 4$ $4 - 2 = 2$	$(-1, 2)$
0	$\left(\frac{1}{4}\right)^0 = \frac{1}{1} = 1$ $1 - 2 = -1$	$(0, -1)$
1	$\left(\frac{1}{4}\right)^1 = \frac{1}{4} = 0.25$ $0.25 - 2 = -1.75$	$(1, -1.75)$
2	$\left(\frac{1}{4}\right)^2 = \frac{1}{16} = 0.0625$ $0.0625 - 2 = -1.9375$	$(2, -1.9375)$
3	$\left(\frac{1}{4}\right)^3 = \frac{1}{64} = 0.015625$ $0.015625 - 2 = -1.984375$	$(3, -1.984375)$

 $(-\infty, \infty)$
 $(-2, \infty)$


The horizontal asymptote is $y = -2$

Domain:

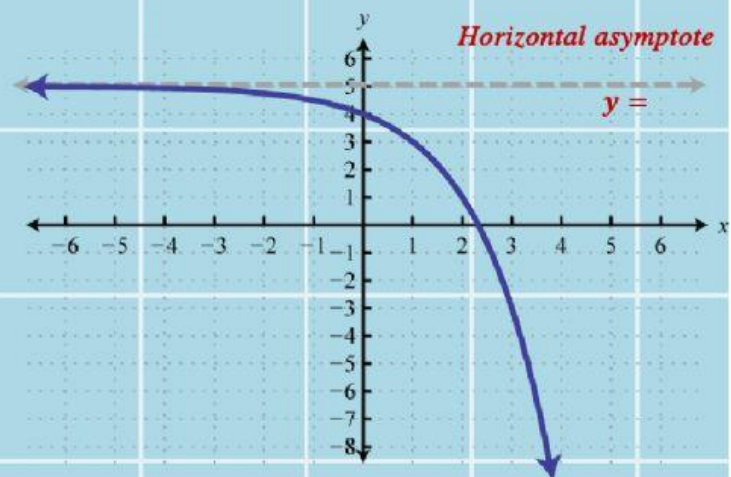
Range:

5. $y = 5 - 2^x$

x	$y = 5 - 2^x$	Solutions
-3	$5 - 2^{-3} = 5 - \frac{1}{2^3} = 5 - \frac{1}{8}$ $= 5 - 0.125 = 4.875$	(-3, 4.875)
-2	$5 - 2^{-2} = 5 - \frac{1}{2^2} = 5 - \frac{1}{4}$ $= 5 - \quad =$	(-2,)
-1	$5 - 2^{-1} = 5 - \frac{1}{2^1} = 5 - \frac{1}{2}$ $= 5 - \quad =$	(-1,)
0	$5 - 2^0 = 5 - \quad =$	(0,)
1	$5 - 2^1 = 5 - \quad =$	(1,)
2	$5 - 2^2 = 5 - \quad =$	(2,)
3	$5 - 2^3 = 5 - \quad =$	(3,)

$(-\infty, 5)$

$(-\infty, \infty)$



The horizontal asymptote is $y =$

Domain:

Range: