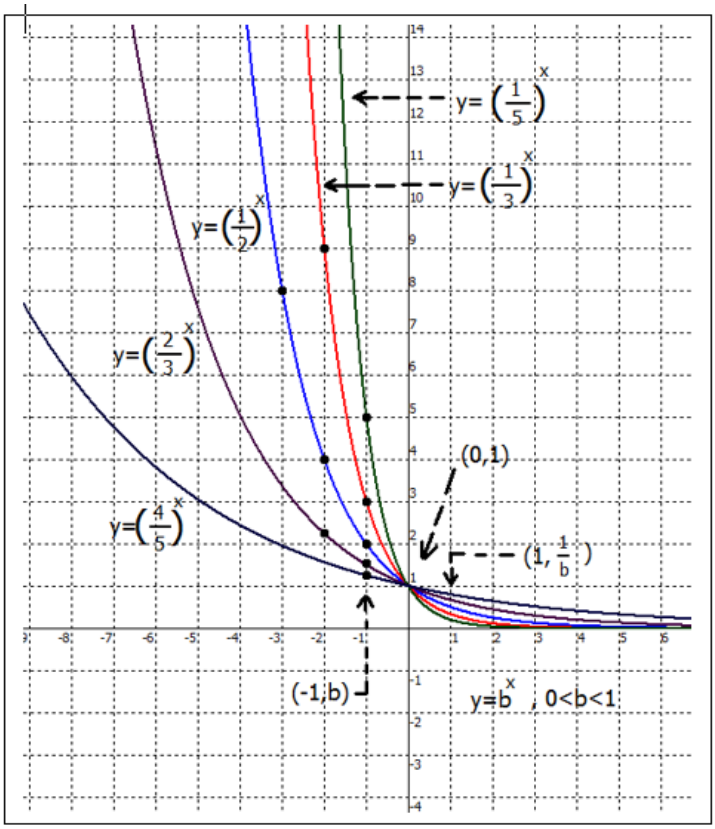
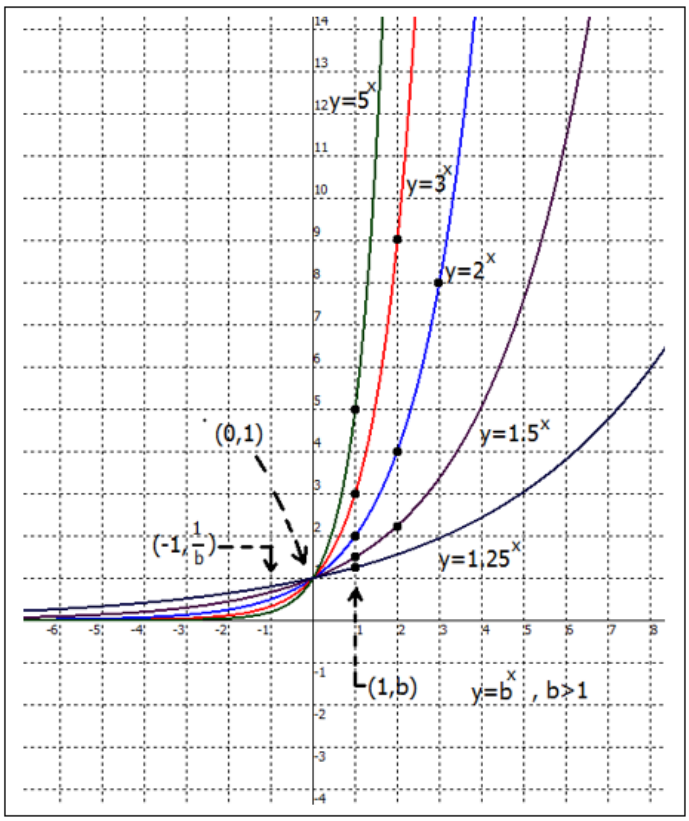
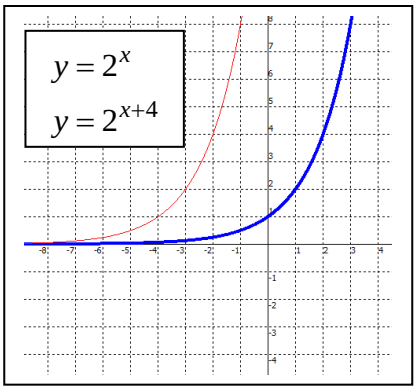
MATH 125 College Algebra Name_____

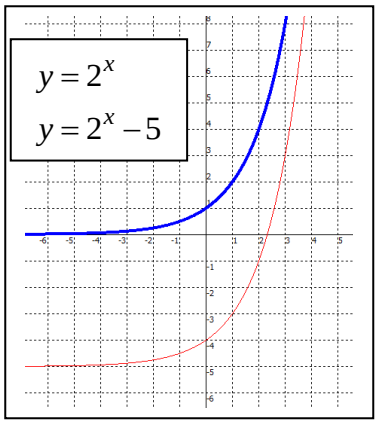
Exponential Functions: $y=(b)^x$

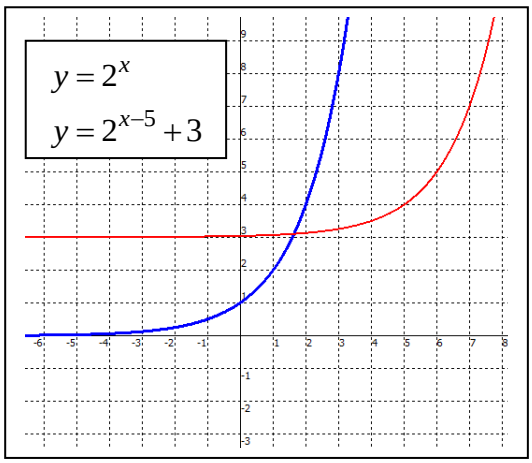
- They are continuous functions over $(-\infty,\infty)$
- They are One – to – One Functions
- Domain: $(-\infty,\infty)$ All real Numbers
- Range: $(0,\infty)$ All Real Numbers greater than Zero
- Increasing function if $b>1$
- Decreasing function if $0<b<1$
- As $y\to 0^+$ the x-axis is a horizontal asymptote for the graph of the function.
- The graph of the function has a y-intercept: (0, 1)
- The graph of the function does not have a x-intercept.
- Key points of the graph also include: $(1,b)$ , $(2,b^2)$ , $\left(-1,\frac{1}{b}\right)$ & $\left(-2,\frac{1}{b^2}\right)$



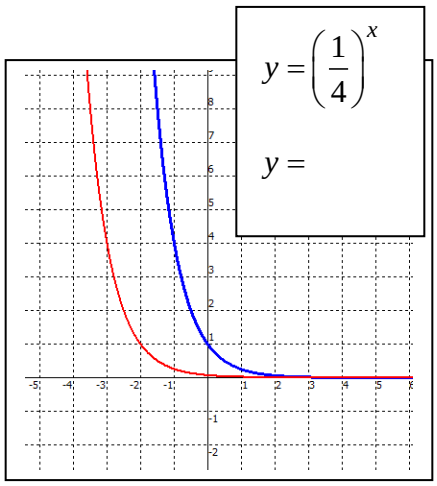



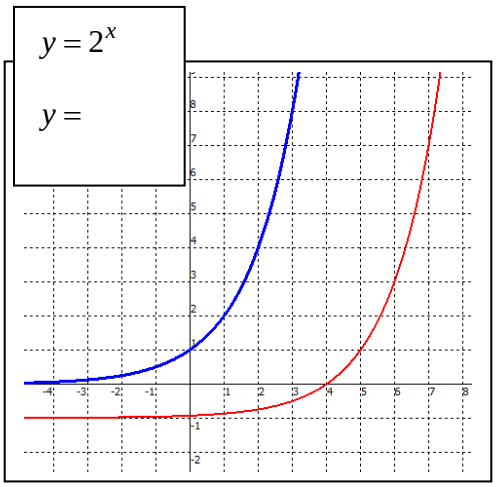



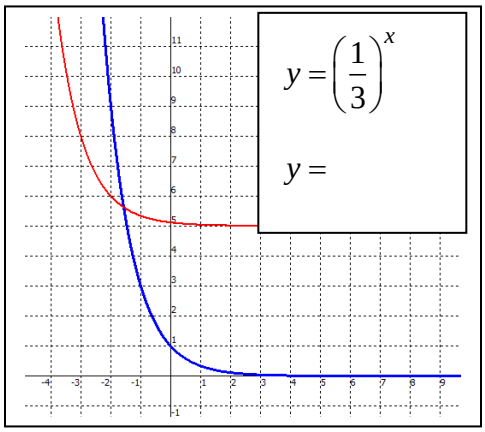



The equation for one curve is given, write an equation for the other curve in each pair of graphs.




$y = b^x$

| $x$ | $y$ |
|---|---|
| $-2$ | $\frac{1}{b^2}$ |
| $-1$ | $\frac{1}{b}$ |
| $0$ | $1$ |
| $1$ | $b$ |
| $2$ | $b^2$ |
| Asym. | $y = 0$ |

$y = a \cdot b^{(x+n)} + m$

$-n$ [ $x$ | $y$ ] $\cdot a$ ] $+ m$

| $x$ | $y$ |
|---|---|
| $-2$ | $\frac{1}{b^2}$ |
| $-1$ | $\frac{1}{b}$ |
| $0$ | $1$ |
| $1$ | $b$ |
| $2$ | $b^2$ |
| Asym. | $y = 0$ |

$y = 3\left(\frac{1}{2}\right)^{(x-4)} - 5$

$+4$ [ $x$ | $y$ ] $\cdot 3$ ] $- 5$

| | $x$ | $y$ | | |
|---|---|---|---|---|
| 2 | $-2$ | 4 | 12 | 7 |
| 3 | $-1$ | 2 | 6 | 1 |
| 4 | 0 | 1 | 3 | $-2$ |
| 5 | 1 | $\frac{1}{2}$ | $\frac{3}{2}$ | $-3\frac{1}{2}$ |
| 6 | 2 | $\frac{1}{4}$ | $\frac{3}{4}$ | $-4\frac{1}{4}$ |
| *Asym.* | | $y = 0 \rightarrow y = -5$ | | |