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Worked on Inverse functions packet.

Ex: $g(x) = \frac{7x-2}{2x+7}$

$2x+7=0$
 $x = -\frac{7}{2}$

D: $(-\infty, -\frac{7}{2}) \cup (-\frac{7}{2}, \infty)$

R: $(-\infty, \frac{7}{2}) \cup (\frac{7}{2}, \infty)$ - The range is always the same as the domain of the inverse

$g^{-1}(x)$:

$g(x) = \frac{7x-2}{2x+7}$

$y = \frac{7x-2}{2x+7}$

$\frac{x}{1} = \frac{7y-2}{2y+7}$

$x(2y+7) = 7y-2$

$2xy+7x = 7y-2$
+2 +2

$2xy+7x+2 = 7y$
-2xy -2xy

$7x+2 = 7y-2xy$

Find Domain and Range of $g(x)$.

Find $g^{-1}(x)$ and the Domain and Range of $g^{-1}(x)$.

$7x+2 = 7y-2xy$

$7x+2 = y(7-2x)$

$y = \frac{7x+2}{7-2x}$

$g^{-1}(x) = \frac{7x+2}{7-2x}$

$7-2x=0$

$7=2x$

$x = \frac{7}{2}$

D: $(-\infty, \frac{7}{2}) \cup (\frac{7}{2}, \infty)$

R: $(-\infty, -\frac{7}{2}) \cup (-\frac{7}{2}, \infty)$

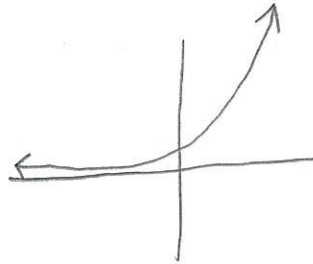
The range is always the same as the domain of the original function.

Exponential Functions

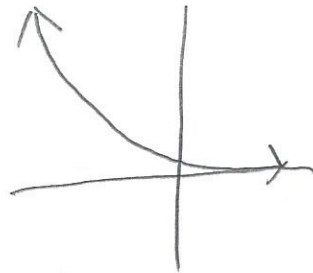
General form: $f(x) = b^x$ $b \neq 1$

Rough sketches

if $b > 1$



if $0 < b < 1$



Ex: $f(x) = 2^x$

| X | y |
|----|---------------|
| -2 | $\frac{1}{4}$ |
| -1 | $\frac{1}{2}$ |
| 0 | 1 |
| 1 | 2 |
| 2 | 4 |

$$\begin{aligned} y &= 2^{-2} \\ &= \frac{1}{2^2} \\ &= \frac{1}{4} \end{aligned}$$

$$\begin{aligned} y &= 2^{-1} \\ &= \frac{1}{2^1} \\ &= \frac{1}{2} \end{aligned}$$

$$\begin{aligned} y &= 2^0 \\ &= 1 \end{aligned}$$

Horizontal asymptote at $y = 0$.

