A. Limit Rules

1. $\lim\limits_{r \to x} a^r = a^x$

2. If $a > 1$, then $\lim\limits_{x \to \infty} a^x = \infty$ and $\lim\limits_{x \to -\infty} a^x = 0$

3. If $0 < a < 1$, then $\lim\limits_{x \to \infty} a^x = 0$ and $\lim\limits_{x \to -\infty} a^x = \infty$

4. $\lim\limits_{x \to 0} (1 + x)^{\frac{1}{x}} = e$

5. $\lim\limits_{x \to \infty} e^x = \infty$ and $\lim\limits_{x \to -\infty} e^x = 0$

Examples:

1. Starting with the graph of $f(x) = 9^x$, write the equation of the graph that results from:

a.) Shifting $f(x)$ 9 units upward.

b.) Shifting $f(x)$ 7 units to the right.

c.) Reflecting $f(x)$ about the x-axis.

2. The domain of the function $f(x) = \dfrac{16}{1 - e^x}$

3. Find the exponential function $f(x) = Ca^x$ whose graph goes through the points (0 , 5) and (2 , 20).

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4. Evaluate the following limit $\lim\limits_{x\to\infty} 0.77^x =$

5. Evaluate the following limit $\lim\limits_{x\to\infty} e^{-x^2} =$

6. Evaluate the following limit $\lim\limits_{x\to\infty} \dfrac{e^{5x}+e^{-5x}}{e^{5x}-e^{-5x}} =$

7. Evaluate the following limit $\lim\limits_{x\to\infty}\left(e^{-2x}\cos x\right)=$

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