**Determining the Equation of an Exponential Function**

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| 1. Choose 2 points from the transformed graph
2. Determine c from the y-value of the horizontal asymptote
3. Subtract c from the y-values of the chosen points (to translate back to the x-axis)
4. Substitute the (x,y) pairs into y = abx to create two equations.
5. Rearrange and solve the system using substitution.
6. State the answer in the form y = ±abx + c.
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**Ex1.** Determine an equation for each of the following graphs in the form of y = abx + c

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**Ex2**. Find the exponential function through (2, 16) and (6, 256) that has a horizontal asymptote at y = 0.

**Ex3**. Find the exponential function through (2, 10) and (4, 22) that has a horizontal asymptote at y = 4.

**Ex4.** Find an exponential function that passes through (3, 12.5) and (4, 11.25) and has a horizontal asymptote of
 y = 10.

**Ex5**. The graph of $f\left(x\right)=2^{x}$is compressed vertically by a factor of $\frac{1}{2}$ reflected in the y-axis, and translated right 4 units and downward 5 units.
**a)** Write the equation of the new function.

**b)** State the domain, range, y-intercept and equation of the horizontal asymptote.

**Ex6.** The equation of the function that represents $f\left(x\right)=(\frac{1}{4})^{x}$ after it is compressed horizontally by a factor of $\frac{1}{2}$, reflected in the x-axis, and shifted 4 to the left and 6 units up.

**a)** Write the equation of the new function.

**b)** State the domain, range, and equation of the horizontal asymptote.