1. Convert $9^{2 x+3} \div 27^{3 x-1} \times 81^{x-1}$ to base 3 and simplify it.
2. Solve for x : a) $3^{5 x-1}=81^{3 x}$
b) $27^{x-2}=\frac{1}{81^{x+3}}$

$$
\text { c) }\left(\frac{125}{216}\right)^{\frac{-x}{4}}=\left(\frac{6}{5}\right)^{3 x-3}
$$

3. How much money will you have in 5 years if you invested $\$ 3000$ compounded monthly at $2.5 \%$ ?
4. The number of fish in a lake is decreasing by $5 \%$ each year as a result of overfishing. If there were 2500 fish in January 2019, how many years, to the nearest tenth, would it take for the fish population to reduce to half?
5. Draw the graph of $f(x)=-3\left(5^{-x-2}\right)-1$ and determine its intercepts, domain and range and equation of the asymptote.

## Answer:

1. $3^{-x+5}$
2. A) $x=-\frac{1}{7}$,
b) $x=-\frac{6}{7}$,
c) $x=\frac{4}{3}$
3. $\$ 3399.00$
4. 13.5 years
5. Y-int: (0, -1.12), Domain: $x \in R$, Range: $y<-1$, asymptote: $y=-1$

| $X$ | $Y$ |
| :---: | :---: |
| -1 | $\frac{1}{5}$ |
| 0 | 1 |
| 1 | 5 |



| $\mathrm{X}^{\prime}$ | $\mathrm{Y}^{\prime}$ |
| :---: | :---: |
| -1 | -1.6 |
| -2 | -4 |
| -3 | -16 |

