12. [10 points] In the following sentences circle all that apply. There might be more than one correct choice for each part.

a. [3 points] The function \( y = r(x) \) has a horizontal asymptote at \( y = 0 \). The formula of \( r(x) \) could be:

\[
\begin{align*}
\frac{x^{2018}}{e^{0.01x}} & \quad x^{-\frac{1}{2}} \\
\frac{x(x-2)(x+1)}{5x^3} & \quad (0.8)^x - 2 \\
\end{align*}
\]

b. [3 points] The equation \( \tan\left(\frac{x}{2} + \pi\right) = 5 \) has solution:

\[
\begin{align*}
arctan(5) - \pi & \quad 2arctan(5) - 2\pi \\
2arctan(5) & \quad 2arctan(5) + \pi \\
\end{align*}
\]

c. [2 points] Let \( Q(x) \) be an odd function such that \( \lim_{x \to 5^-} Q(x) = -\infty \). Then \( \lim_{x \to -5^+} Q(x) \) is equal to:

\[
\begin{align*}
-\infty & \quad 0 \quad +\infty \quad 5 \\
\end{align*}
\]

d. [2 points] Let \( g(x) \) be a function that has domain \([0, \infty)\) and \( f(x) = x^3 + x^2 \). The domain of \( g(f(x)) \) is:

\[
\begin{align*}
[0, \infty) & \quad [-1, \infty) \quad \text{all real numbers} \quad (-\infty, 1) \\
\end{align*}
\]