

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:

$\frac{x^{2018}}{e^{0.01x}}$

$x^{-\frac{1}{2}}$

NONE OF THESE

$\frac{x(x-2)(x+1)}{5x^3}$

$(0.8)^x - 2$

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

$\arctan(5) - \pi$

$2 \arctan(5) - 2\pi$

NONE OF THESE

$2 \arctan(5)$

$2 \arctan(5) + \pi$

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

$-\infty$

0

$+\infty$

5

NONE OF THESE

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:

$[0, \infty)$

$[-1, \infty)$

all real numbers

$(-\infty, 1]$

NONE OF THESE