**10**. [9 points] For each part of this problem, circle **all** of the expressions which could be formulas for the function described. There could be more than one answer for each part.

**a.** [3 points] The function $f(x)$ satisfies $\lim\limits_{x \to -\infty} f(x) = +\infty$. Then $f(x)$ **could** be:

$7x$ $\qquad\qquad$ $\tan(5\pi x)$ $\qquad\qquad$ $\boxed{3^{-x}}$ $\qquad\qquad$ $\boxed{x^4 + 6}$

$\ln(10x - 1)$ $\qquad\qquad$ $\sin\left(\dfrac{\pi}{2}(x + 1)\right)$ $\qquad\qquad$ NONE OF THESE

**b.** [3 points] The function $k(x)$ has a vertical asymptote at $x = \dfrac{1}{10}$. Then $k(x)$ **could** be:

$7x$ $\qquad\qquad$ $\boxed{\tan(5\pi x)}$ $\qquad\qquad$ $3^{-x}$ $\qquad\qquad$ $x^4 + 6$

$\boxed{\ln(10x - 1)}$ $\qquad\qquad$ $\sin\left(\dfrac{\pi}{2}(x + 1)\right)$ $\qquad\qquad$ NONE OF THESE

**c.** [3 points] The function $j(x)$ is periodic with period 4. Then $j(x)$ **could** be:

$7x$ $\qquad\qquad$ $\tan(5\pi x)$ $\qquad\qquad$ $3^{-x}$ $\qquad\qquad$ $x^4 + 6$

$\ln(10x - 1)$ $\qquad\qquad$ $\boxed{\sin\left(\dfrac{\pi}{2}(x + 1)\right)}$ $\qquad\qquad$ NONE OF THESE