

11. [12 points] For each of the questions below, circle **all** solutions that are correct.

a. [3 points] Let $Q(x) = \frac{(3+2x)(6x^2-9)}{(3x^2+1)(7-x)}$.

What are the **horizontal** asymptote(s) of $2Q(3x+6) + 7$?

$y = -1$

$y = 3$

$y = -6$

$y = -11$

$y = -4$

$y = \frac{12}{7}$

None of these

b. [3 points] If $\sin(x) = \frac{4}{5}$, then what value(s) can $\cos(x)$ be?

$\frac{3}{5}$

$\frac{1}{3}$

$-\frac{3}{5}$

$\frac{\sqrt{3}}{2}$

$-\frac{\sqrt{3}}{2}$

$-\frac{1}{3}$

None of these

c. [3 points] The function $f(x)$ has the property $\lim_{x \rightarrow \infty} f(x) = \infty$. Which of the following could be $f(x)$?

$\ln(x)$

$\frac{.001e^x}{30x^{100} + 14x^{200}}$

$e^{\sin(x)+\cos(x)}$

$\frac{x^{\frac{1}{2}} + 4}{(\ln(x))^4 - x^{\frac{2}{3}}}$

x^{-2}

$\frac{x^4 + 3x^2 + 7}{3x^3 + x + x^5}$

None of these

d. [3 points] Which functions are periodic with period 4?

$5 \sin\left(\frac{\pi}{2}(x-3)\right) + 1$

$4 \cos\left(\frac{2}{\pi}(x+2)\right)$

$\tan\left(\frac{\pi x}{4}\right)$

$e^{\cos(4x)}$

$\tan\left(\frac{\pi x}{2}\right) + 4$

$e^{\sin\left(\frac{2x}{\pi}\right)}$

None of these