

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