

Practice Test 1

Math 141 - 005/006.

1) Let $f(x) = \sqrt{x}$, $g(x) = x^6 - x^4$.

Find and state the domain of $f \circ g(x)$ and $g \circ f(x)$.

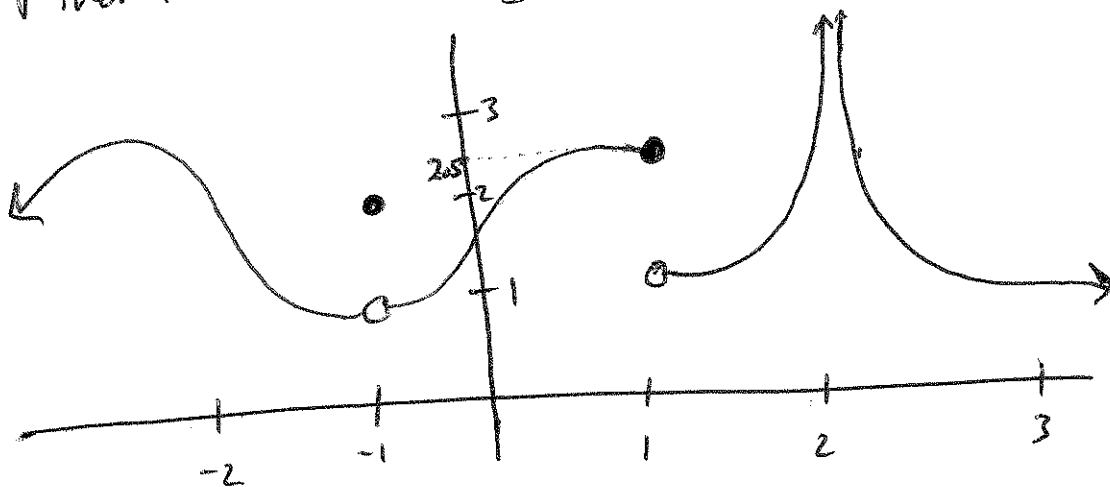
2) Find an expression for $\sin(\arccos(x))$.

3) Solve for t .

a) $\ln\left(\frac{2}{t}\right) + \ln(2t^2) = \ln(8)$

b) $e^{2x+3} - 7 = 0$

4) Find the limits using the following Graph



$f(-1) = \underline{\hspace{2cm}}$

$\lim_{x \rightarrow 1^+} f(x) = \underline{\hspace{2cm}}$

$\lim_{x \rightarrow -1} f(x) = \underline{\hspace{2cm}}$

$f(1) = \underline{\hspace{2cm}}$

$\lim_{x \rightarrow 1^-} f(x) = \underline{\hspace{2cm}}$

$\lim_{x \rightarrow 2} f(x) = \underline{\hspace{2cm}}$

$f(2) = \underline{\hspace{2cm}}$

$\lim_{x \rightarrow 1} f(x) = \underline{\hspace{2cm}}$

5) Find The following Limits.

$$\lim_{x \rightarrow 3} \frac{x^2 - 9}{x^2 + 2x - 3}, \quad \lim_{x \rightarrow 1} e^{x^3 - x}, \quad \lim_{r \rightarrow 9} \frac{\sqrt{r}}{(r-9)^4}$$

$$\lim_{x \rightarrow \infty} \frac{\sqrt{x^2 - 9}}{2x - 6}, \quad \lim_{x \rightarrow -\infty} \frac{\sqrt{x^2 - 9}}{2x - 6}, \quad \lim_{x \rightarrow 3} \frac{\sqrt{x+6} - x}{x^3 - 3x^2}$$

6) $f(x) = \begin{cases} \sin(x) & x < \frac{\pi}{4} \\ \cos(x) & x \geq \frac{\pi}{4} \end{cases}$ Show That f is Continuous at $x = \frac{\pi}{4}$.

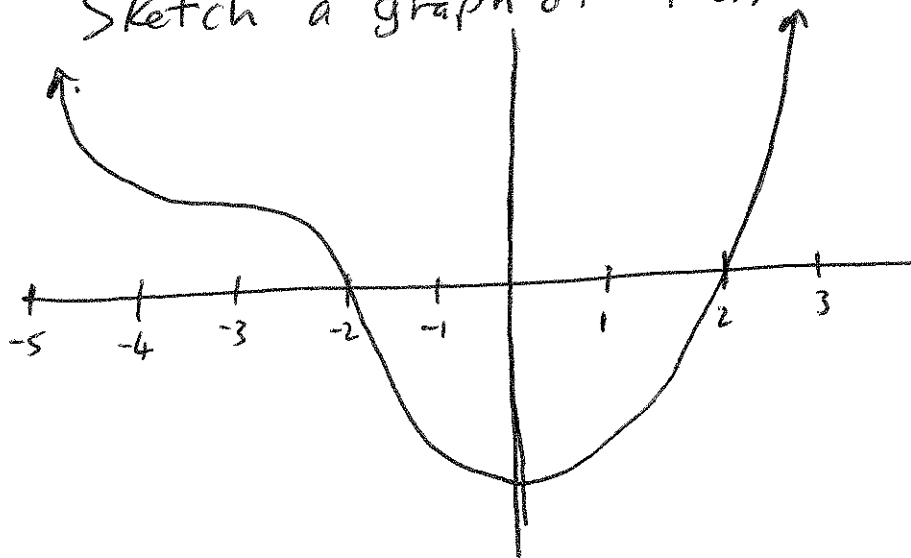
7) Find The derivative using The definition.

a) $f'(2)$ for $f(x) = x^2 - 1$.

b) $f'(1)$ for $f(x) = \sqrt{x}$.

c) $f'(x)$ for $f(x) = \frac{x-1}{x-2}$.

8) Sketch a graph of $f'(x)$ based on The picture of $f(x)$.



Label your axes, ~~and~~