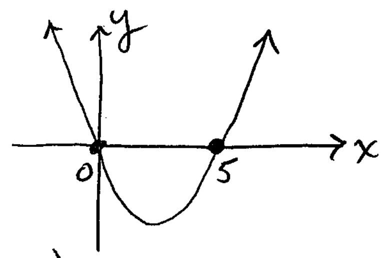
Name: SOLUTIONS.
Stu#:

(1) **[4 points]** Find the domain of $h(x) = \dfrac{1}{\sqrt[4]{x^2 - 5x}}$.

Must have $x^2 - 5x > 0$.

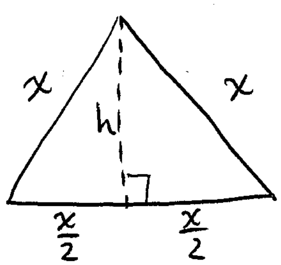
$y = x^2 - 5x$ has graph :



$\therefore$ $x^2 - 5x > 0$ on $(-\infty, 0)$ and $(5, \infty)$.

$\therefore$ domain of $h(x)$ is $(-\infty, 0) \cup (5, \infty)$.

(2) **[4 points]** Express the area A of an equilateral triangle as a function of the length x of a side.



$A = \frac{1}{2} x h$

By Pythagoras : $h^2 + \left(\frac{x}{2}\right)^2 = x^2$

$\therefore h = \sqrt{x^2 - \left(\frac{x}{2}\right)^2}$

$= \sqrt{x^2 - \frac{x^2}{4}}$

$= \frac{\sqrt{3}\, x}{2}$

$\therefore A = \frac{1}{2} x \cdot \frac{\sqrt{3}\, x}{2}$

$= \frac{\sqrt{3}\, x^2}{4}$

Math 121 M09N01 - Quiz 1
May 11 2009

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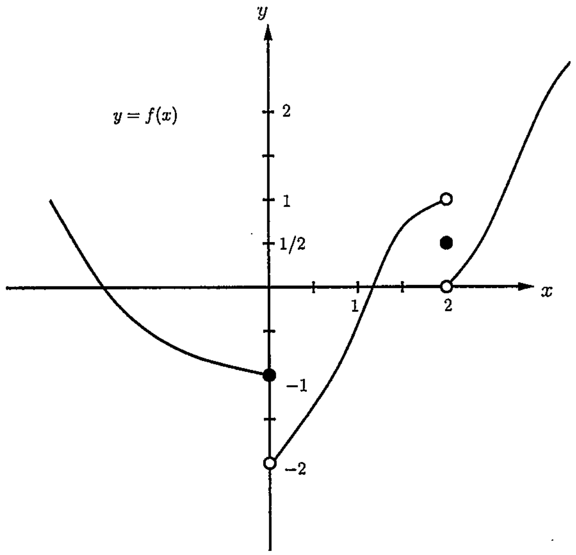
(3) [**4 points**] Evaluate the limit if it exists:

$$\lim_{x\to 2} \frac{x^2+x-6}{x-2} \to \text{“}\frac{0}{0}\text{''}$$

$$= \lim_{x\to 2} \frac{\cancel{(x-2)}(x+3)}{\cancel{(x-2)}}$$

$$= 5$$

(4) [**3 points**] Determine $\lim_{x\to 0^+} f(x)$ and $\lim_{x\to 2^-} f(x)$:



$$\lim_{x\to 0^+} f(x) = -2$$

$$\lim_{x\to 2^-} f(x) = 1$$