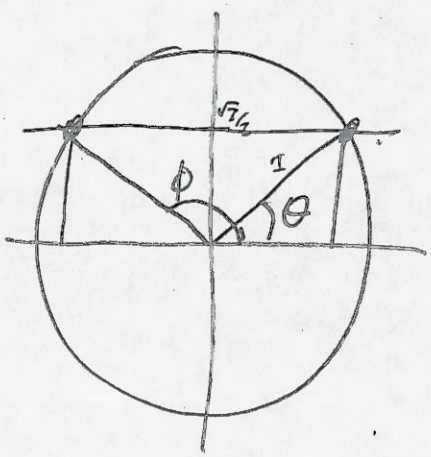
IN CLASS QUIZ 1

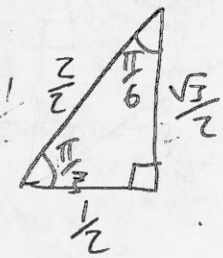
NAME:_____

1. Find all of the solutions to $\sin(x) = \sqrt{3}/2$ in the interval $[0, 2\pi]$.



x is the angle θ or ϕ shown

Recall the triangle



So

$x = \frac{\pi}{3}$ or $\pi - \frac{\pi}{3} = \frac{2\pi}{3}$

(6)

2. Evaluate $\lim_{x \to \frac{1}{2}} (4x+1)(2x-1)$. $= \left(\frac{4}{2}+1\right)\left(\frac{2}{2}-1\right) = 0$

(4)

3. Evaluate $\lim_{t \to 3} (t^2 + 9t^{-3})$. $= 3^2 + \frac{9}{3^3} = 9 + \frac{3^2}{3^3} = 9 + \frac{1}{3} = \frac{27}{3} + \frac{1}{3}$

$= \frac{28}{3}$

(4)

4. Determine the points at which the function $f(x) = \frac{1}{|x-1|}$ is discontinuous and state the type of discontinuity: removable, jump, infinite, or other, at these points.

f(x) has a discontinuity at $x=1$ (2)

$\lim_{x\to 1+} \frac{1}{|x-1|} = +\infty$ so infinite (2)

$\lim_{x\to 1-} \frac{1}{|x-1|} = +\infty$

5. Give an example where $\lim_{x\to c} f(x)$ and $\lim_{x\to c} g(x)$ both exist, but $\lim_{x\to c}(f(x)+g(x))$ does not.

$f(x) = \sin\left(\frac{1}{x}\right)$

$g(x) = -\sin\left(\frac{1}{x}\right)$

$c = 0$ (4)

6. Suppose $\lim_{x\to 2} f(x) = 3$ and $\lim_{x\to 2} g(x) = -4$. Using the limit laws, calculate $\lim_{x\to 2} \frac{f(x)+1}{3f(x)-g(x)}$. **Clearly indicate which limit laws you are applying at each step in your solution.**

$\lim_{x\to 2} \frac{f(x)+1}{3f(x)-g(x)}$ quotient law $\frac{\lim_{x\to 2}(f(x)+1)}{\lim_{x\to 2}(3f(x)-g(x))}$ sum $x2$ $= \frac{(\lim_{x\to 2} f(x)) + (\lim_{x\to 2} 1)}{\lim_{x\to 2}(3f(x)) + \lim_{x\to 2}(-g(x))}$

const mult $x2$ $= \frac{4}{3(\lim_{x\to 2}(f(x))) + (-1)\lim_{x\to 2} g(x)} = \frac{4}{9+4} = \frac{4}{13}$

(2) args

(4) full justn.