

Quiz 6

Directions: Algebraically evaluate each of the following limits.

1) $\lim_{x \rightarrow \infty} \frac{3x^2 - 1}{x^3 - 2} = \frac{3x^2}{x^3} \quad 2 < 3 \quad = \boxed{0}$
 HIA Rule!

4) $\lim_{x \rightarrow \infty} \frac{-x^2 - 4x - 2}{2x^2 + 3} = \frac{-x^2}{2x^2} = -\frac{1}{2}$
 HIA Rule!

2) $\lim_{x \rightarrow 3} x^2 + 9 = 3^2 + 9 = \boxed{18}$

5) $\lim_{x \rightarrow \infty} 2x^2 - 3x = \infty$
 End behavior rule!

3) $\lim_{x \rightarrow 1} \frac{\sqrt{x+15}-4}{x-1} = \frac{0}{0}$

$\frac{x+15-16}{x-1(\sqrt{x+15}+4)} = \frac{x-1}{x-1(\sqrt{x+15}+4)}$
 $\frac{1}{\sqrt{x+15}+4}$
 $\lim_{x \rightarrow 1} \frac{1}{\sqrt{x+15}+4} = \frac{1}{\sqrt{16}+4} = \boxed{\frac{1}{8}}$

6) $\lim_{x \rightarrow 5} \frac{x-3}{x^2-8x+15} = \frac{-5-3}{5^2-8(5)+15} = \frac{-8}{0}$
 $\frac{-(x-3)}{(x-3)(x-5)} = \frac{-1}{x-5}$
 $\lim_{x \rightarrow 5} \frac{-1}{x-5} = \frac{-1}{0}$
 DNE

7) $\lim_{x \rightarrow 0} \frac{\frac{1}{x+2} - \frac{1}{2}}{x} = \frac{0}{0}$

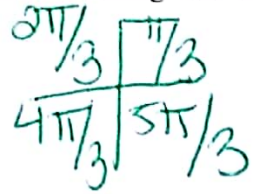
(2) $\frac{\frac{1}{x+2} - \frac{1}{2}}{x} = \frac{\frac{2}{2(x+2)} - \frac{(x+2)}{2(x+2)}}{x} = \frac{2-x-2}{2(x+2)x} = \frac{-x}{2(x+2)x}$

$\frac{-x}{2(x+2)x} = \frac{-x}{2(x+2)} \cdot \frac{1}{x} = \frac{-1}{2(x+2)}$

$\lim_{x \rightarrow 0} \frac{-1}{2(x+2)} = \frac{-1}{2(0+2)} = \boxed{-\frac{1}{4}}$

Directions: For each of the following find the exact value of the trigonometry function.

8) $\sin 2\pi/3$



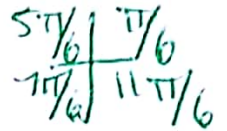
Q: II

R: 60°

S: +

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

10) $\sec 7\pi/6$



Q: III

R: 30°

S: -

$\cos 7\pi/6$

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

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

9) $\sec 225^\circ$

$\cos 225$

Q: III

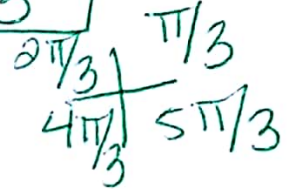
R: $225 - 180 = 45$

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

S: -

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

11) $\tan 5\pi/3$



Q: IV

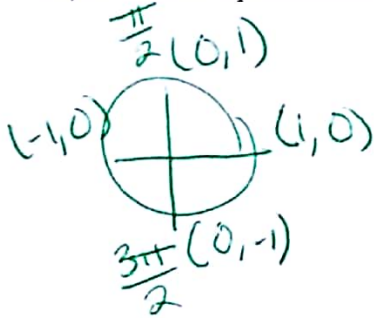
R: 60°

S: -

$$-\sqrt{3}$$

12) Solve the equation for $0 \leq x < 2\pi$.

$$4 \cos \theta \sin \theta - 2 \cos \theta = 0$$



$$2 \cos \theta (\sin \theta - 1) = 0$$

$$2 \cos \theta = 0 \quad 2 \sin \theta - 1 = 0$$

$$\cos \theta = 0$$

$$2 \sin \theta = 1$$

$$\sin \theta = 1/2$$

$\theta = 30$ & 30 ($\pi/6$)

	30	45	60
Sin	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$
cos	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$
tan			

$$\theta = \frac{\pi}{2}$$

$$\theta = \frac{3\pi}{2}$$

$$\theta = \pi/6$$

$$\theta = 5\pi/6$$

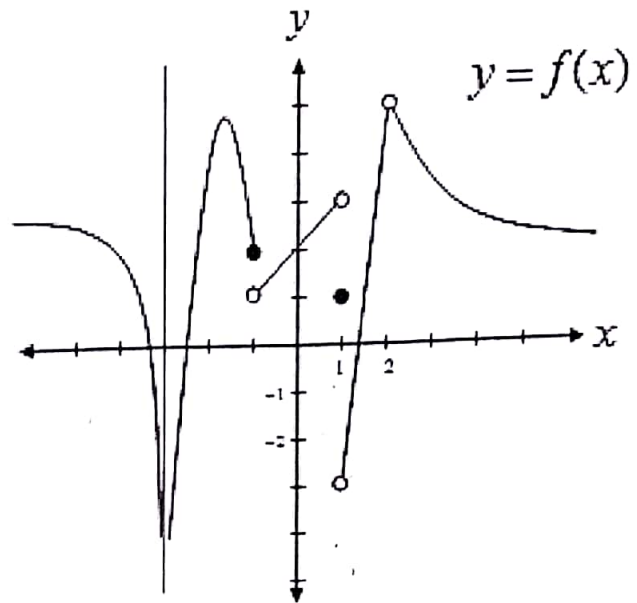
Directions: For #13-20, answer each of the following by using the graph of $f(x)$.

13) $f(1) = 1$

14) $\lim_{x \rightarrow 1^-} f(x) = 3$

15) $\lim_{x \rightarrow 1^+} f(x) = -3$

16) $\lim_{x \rightarrow 1} f(x) = \text{DNE}$



17) $f(-1) = 2$

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

19) $\lim_{x \rightarrow -1^+} f(x) = 1$

20) $\lim_{x \rightarrow -1} f(x) = \text{DNE}$