$$\lim_{x\to 1} \sin\left(\frac{\pi x}{2}\right) = 1$$

$$\sin\left(\frac{\pi(1)}{2}\right)$$

$$\sin\left(\frac{\pi}{2}\right)$$

$$1$$

$$\lim_{x\to 1} 1$$

$$1$$

$$\lim_{x\to \pi} \tan(x) = -1$$

$$\tan(\pi)$$

$$\frac{\sin(\pi)}{\cos(\pi)}$$

$$\frac{0}{-1}$$

$$\lim_{x\to \pi} -1$$

$$-1$$

$$\lim_{x\to 3} \tan\left(\frac{\pi x}{4}\right) = -1$$

$$\tan\left(\frac{\pi(3)}{4}\right)$$

$$\tan\left(\frac{3\pi}{4}\right)$$

$$\lim_{x\to 3} -1$$

$$-1$$

$$\lim_{x\to 7} \sec\left(\frac{\pi x}{6}\right) = \frac{-2\sqrt{3}}{3}$$

$$\frac{1}{\cos\left(\frac{\pi x}{6}\right)}$$

$$\frac{1}{\cos\left(\frac{7\pi}{6}\right)}$$

$$\frac{1}{\frac{-\sqrt{3}}{2}}$$

$$1 \div \frac{-\sqrt{3}}{2}$$

$$1 \cdot \frac{2}{-\sqrt{3}}$$

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

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

$$\lim_{x\to 7} \frac{-2\sqrt{3}}{3}$$

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

$$\lim_{x \to 0} \frac{1-\sin(2x)}{\cos(x)}$$

$$=$$

$$\frac{1-\sin(2\cdot 0)}{\cos(0)}$$

$$=$$

$$\frac{1-\sin(0)}{\cos(0)}$$

$$=$$

$$\frac{1-0}{1}$$

$$=$$

$$\frac{1}{1}$$

$$=$$

$$1$$

$$\lim_{x \to 0} 1$$

$$=$$

(1)

$$\lim_{x \to \pi/2} \frac{1-\cos(2x)}{\sin(x)}$$

$$=$$

$$\frac{1-\cos\left[2\left(\frac{\pi}{2}\right)\right]}{\sin\left(\frac{\pi}{2}\right)}$$

$$=$$

$$\frac{1-\cos(\pi)}{1}$$

$$=$$

$$\frac{1-(-1)}{1}$$

$$=$$

$$\frac{1+1}{1}$$

$$=$$

$$2$$

$$\lim_{x \to \pi/2} 2$$

$$=$$

(2)