Condition

lim square root(x^2+16)-4/x
x-0

Solution

$$\lim_{x\to 0}\frac{\sqrt{x^2+16}-4}{x}=\frac{\sqrt{0+16}-4}{0}=\frac{4-4}{0}=\left|\frac{0}{0}\right|$$

Multiplying both the numerator and denominator by $\sqrt{x^2+16}+4$:

$$\lim_{x\to 0}\frac{\left(\sqrt{x^2+16}-4\right)\cdot\left(\sqrt{x^2+16}+4\right)}{x\cdot\left(\sqrt{x^2+16}+4\right)}=\lim_{x\to 0}\frac{\left(\sqrt{x^2+16}\right)^2-4^2}{x\cdot\left(\sqrt{x^2+16}+4\right)}=$$

$$=\lim_{x\to 0}\frac{x^2+16-16}{x\cdot\left(\sqrt{x^2+16}+4\right)}=\lim_{x\to 0}\frac{x^2}{x\cdot\left(\sqrt{x^2+16}+4\right)}=\lim_{x\to 0}\frac{x}{\sqrt{x^2+16}+4}=\frac{0}{\sqrt{0+16}+4}=\frac{0}{4+4}=0.$$

Answer

Bonus

If the condition was slightly different

Condition

lim square root(x^2+16)-4/x
x-0

Solution

$$\lim_{x\to 0}\left(\sqrt{x^2+16}-\frac{4}{x}\right)=\sqrt{0+16}-\frac{4}{0}=-\infty.$$

Answer

$-\infty$.