

Evaluating limits when $x \rightarrow 0$.

1. Show $\lim_{x \rightarrow 0} (x^2 - 2)^2 + 6 = 10$.

2. Show $\lim_{x \rightarrow 0} \frac{5x}{x} = 5$.

3. Show $\lim_{x \rightarrow 0} \frac{17x}{2x} = 17/2$.

4. Show $\lim_{x \rightarrow 0} \frac{-317x}{422x} = -317/422$.

5. Show $\lim_{x \rightarrow 0} \frac{-317x - 3}{422x + 5} = -3/5$.

6. Show $\lim_{h \rightarrow 0} \frac{\sqrt{x+h} - \sqrt{x}}{h} = \frac{1}{2\sqrt{x}}$.

7. Show $\lim_{x \rightarrow 0} \frac{\sqrt{1+x+x^2} - 1}{x} = 1/2$.

8. Show $\lim_{x \rightarrow 0} \frac{\sqrt{3+x} - \sqrt{3}}{x} = 1/(2\sqrt{3})$.

9. Show $\lim_{h \rightarrow 0} \frac{1}{h} \left(\frac{1}{\sqrt{x+h}} - \frac{1}{\sqrt{x}} \right) = -(1/2)x^{-3/2}$.

10. Show $\lim_{x \rightarrow 0} \frac{2x}{\sqrt{a+x} - \sqrt{a-x}} = 2\sqrt{a}$.

11. Show $\lim_{x \rightarrow 0} \frac{\sqrt{1+x} - 1}{x} = 1/2$.

12. Show $\lim_{x \rightarrow 0} \frac{x}{\sqrt{1+x} - 1} = 2$.

13. Show $\lim_{x \rightarrow 0} \frac{e^x + e^{-x} - 2}{x^2} = 1$.

14. Show

$$\lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h} = \frac{a}{2\sqrt{ax+b}}$$

when $f(x) = \sqrt{ax+b}$.

15. Show

$$\lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h} = mn(mx+c)^{n-1}$$

when $f(x) = (mx+c)^n$.