

$$\textcircled{1} \lim_{x \rightarrow 0} \frac{x^2 - 4x + 3}{x^2 - 3x} = \frac{3}{-3} = -1$$

$$\Delta = (1)^2 - 4 \cdot 3 \cdot (-4) = 49$$

$$\Delta = 49 = 7^2$$

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$$x = \frac{4 \pm 7}{2} = \frac{11}{2} \text{ or } -\frac{3}{2}$$

$$x_1 = \frac{11}{2}$$

$$x_2 = -\frac{3}{2}$$

$$x_1 = 5.5$$

$$x_2 = -1.5$$

$$\lim_{x \rightarrow 0} \frac{x^2 - 4x + 3}{x^2 - 3x} = 30$$

$$\textcircled{2} \lim_{x \rightarrow 0} \frac{\sqrt{x^2 + 1} - \sqrt{x^2 - 1}}{x}$$

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

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

$$\textcircled{3} \lim_{h \rightarrow 0} \frac{(2x+h)^2 - 4x^2}{h}$$

$$\frac{4x^2 + 4xh + h^2 - 4x^2}{h} = \frac{4xh + h^2}{h} = 4x + h$$

$$\lim_{h \rightarrow 0} (4x + h) = 4x$$

$$\textcircled{4} \lim_{x \rightarrow 4} \frac{(x^2 - 4x + 4)(x - 4)}{x - 4}$$

$$\Delta = (4)^2 - 4 \cdot 4 = 0$$

$$\Delta = 0 = 0^2$$

$$x = \frac{4 \pm 0}{2} = 2$$

$$x_1 = 2$$

$$x_2 = 2$$

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