Tangenthældning på graf for en funktion

```
> restart
```

Funktion

```
> f := x -> 1/2 * x^2 - 2*x + 3
```

$$f := x \to \frac{1}{2} x^2 - 2 x + 3 \tag{1.1}$$

Simuleret håndregning

```
> f(x[0])
```

$$\frac{1}{2} x_0^2 - 2 x_0 + 3 \tag{2.1}$$

```
> f(x[0] + h)
```

$$\frac{1}{2} (x_0 + h)^2 - 2 x_0 - 2 h + 3 \tag{2.2}$$

```
> f(x[0] + h) - f(x[0])
```

$$\frac{1}{2} (x_0 + h)^2 - 2 h - \frac{1}{2} x_0^2 \tag{2.3}$$

```
> simplify(%)
```

$$\frac{1}{2} h (h + 2 x_0 - 4) \tag{2.4}$$

```
> %/h
```

$$\frac{1}{2} h + x_0 - 2 \tag{2.5}$$

```
> simplify(%)
```

$$\frac{1}{2} h + x_0 - 2 \tag{2.6}$$

```
> limit(%, h = 0)
```

$$-2 + x_0 \tag{2.7}$$

Færdig formel

```
> limit((f(x[0] + h) - f(x[0]))/h, h = 0)
```

$$-2 + x_0 \tag{3.1}$$