

Solutions

2.1 $\frac{dy}{dx}=3x^2-3$. At $x=2$ it is $12-3=9$.

2.2 Substitute into the original curve: $y(1)=1-3=-2$.

2.3 The derivative is $12x^2$; at 2 it is $12 \times 4=48$.

3.1 False. For $f(x)=x^3$, $f'(0)=0$ but x^3 is increasing on both sides of zero. This stationary point is not a local extremum; inspect the gradient sign change.

Local review guidance: show the chosen method; give the checked result; explain the condition or failed shortcut. This is authored classroom guidance.