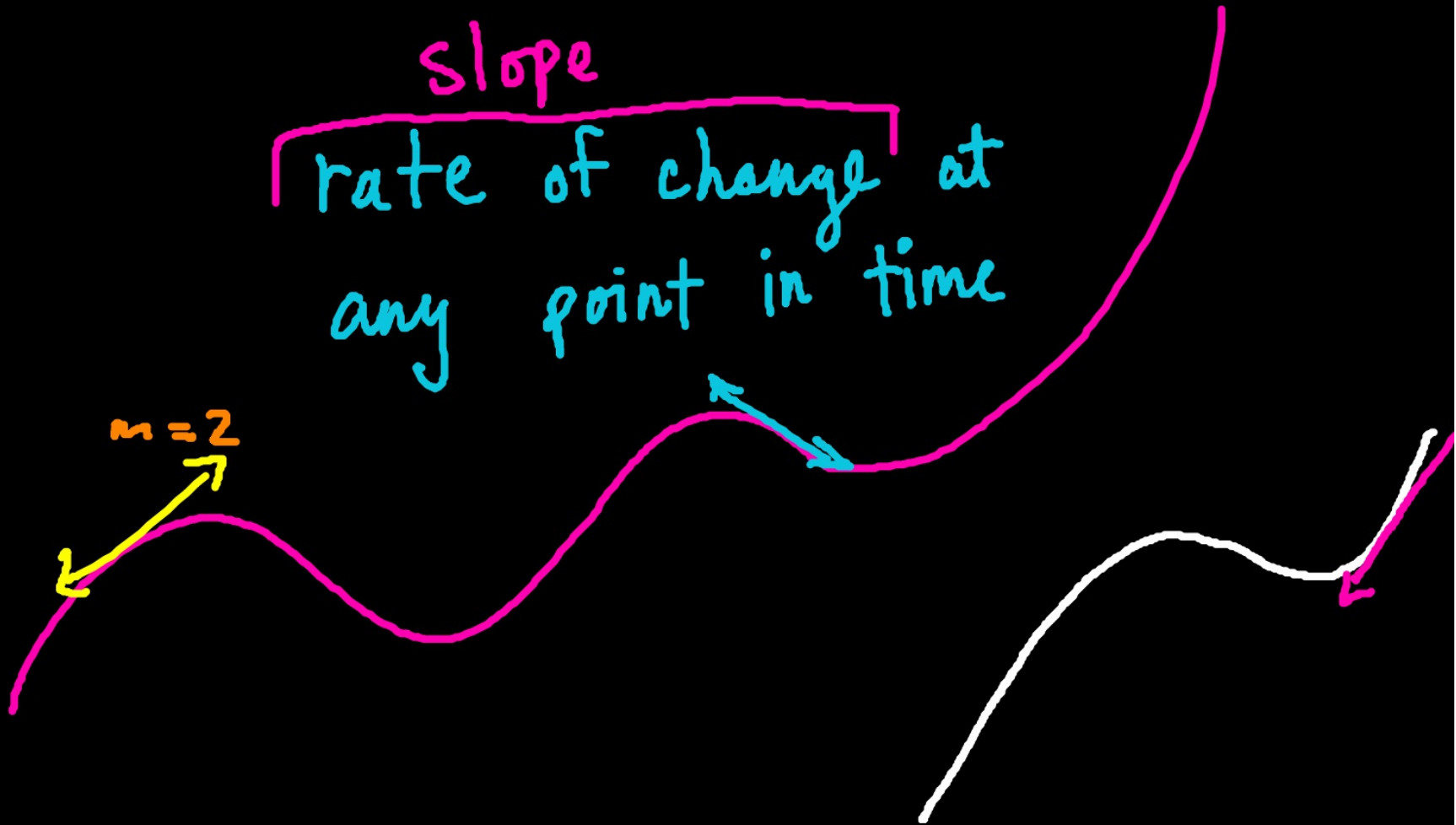
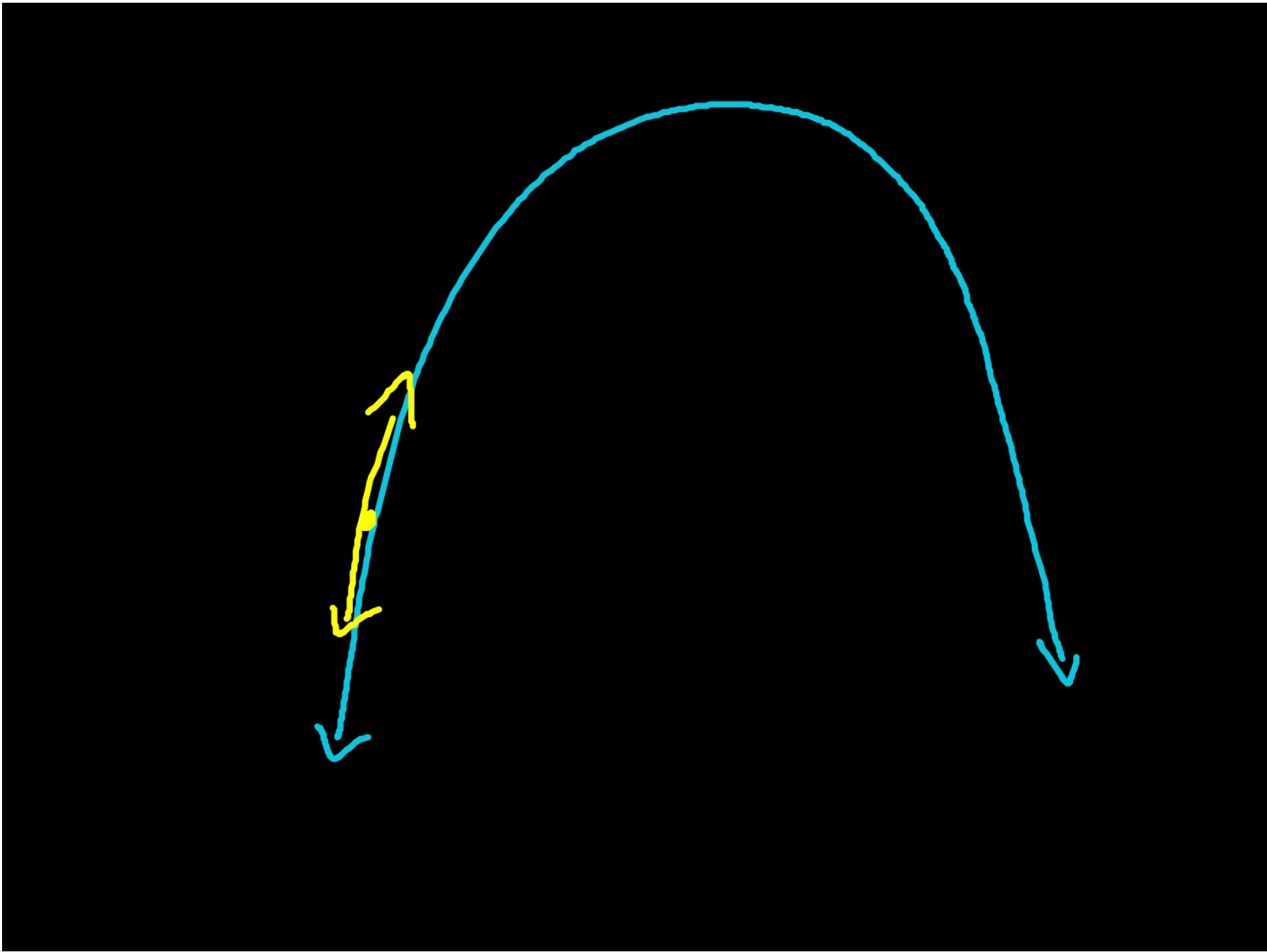


What is differential calculus?

slope

rate of change at
any point in time





Today's learning objective:

chips

By the end of class, I will be able to define "differential calculus" and "derivative" as well as calculate a derivative.

→ finds the slope

Today's language objective:

Tangent

Derivative

Limit

Differential Calculus

Gradient: slope

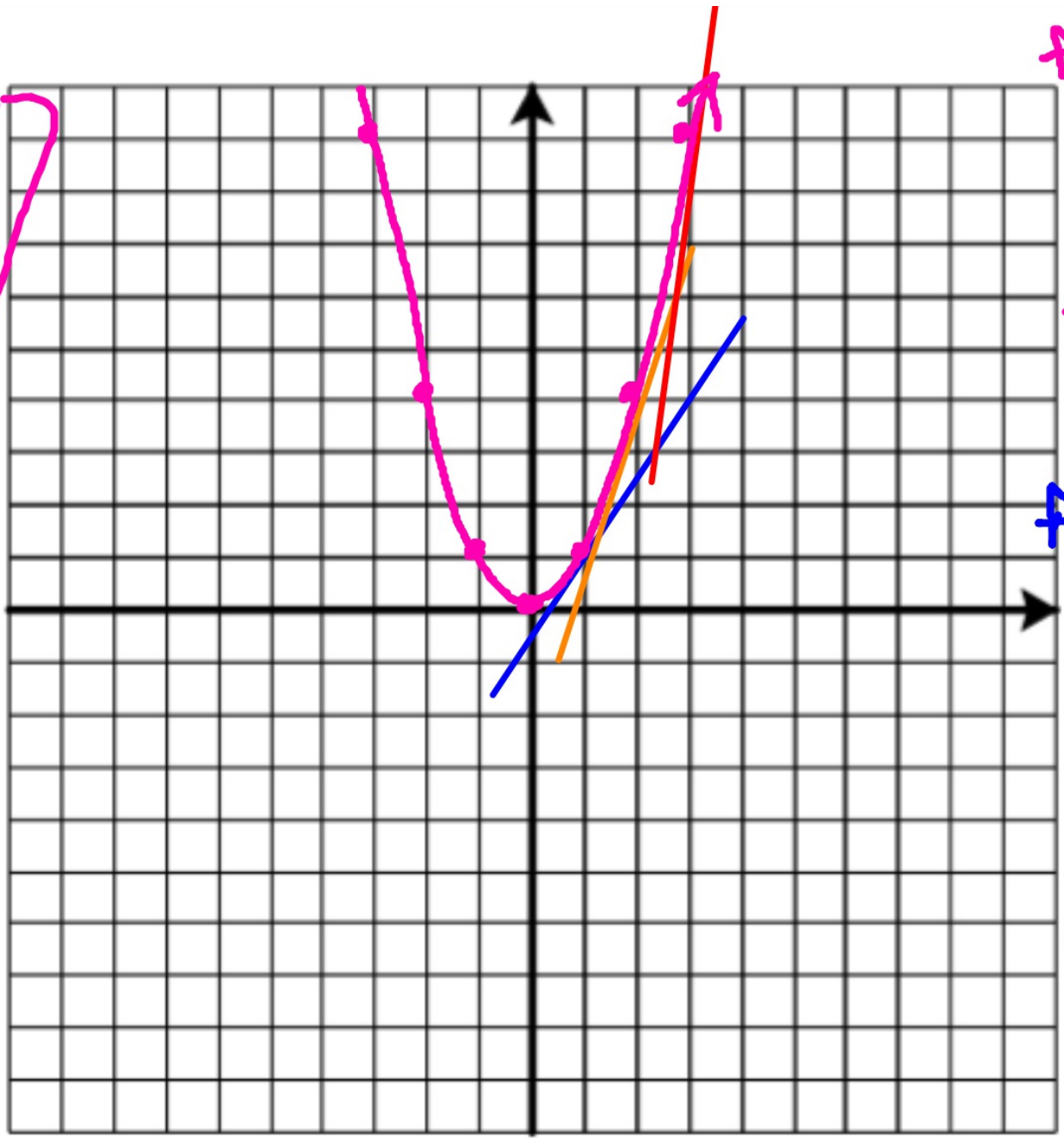
Minimum

Maximum

2, 3, 2
2, 2, 2

2,

5, 5, 5
6, 2, 5, 5
8, 6, 5, 5

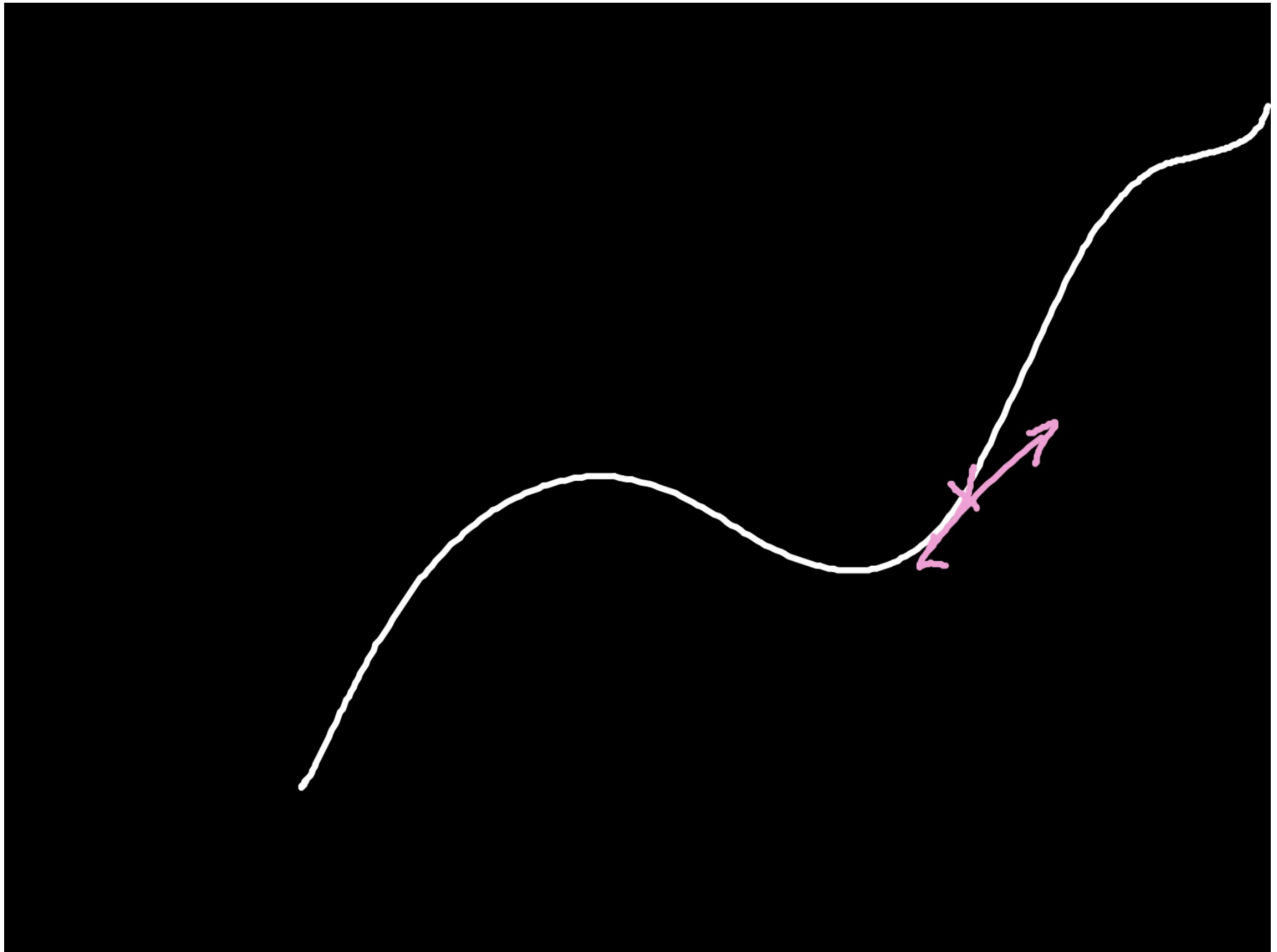


$$f(x) = x^2$$

Domain
 $-3 \leq x \leq 3$

$$f'(x) = 2x^{2-1}$$
$$= 2x^1$$
$$= 2x$$

$$f'(1) = 2(1)$$
$$= 2$$

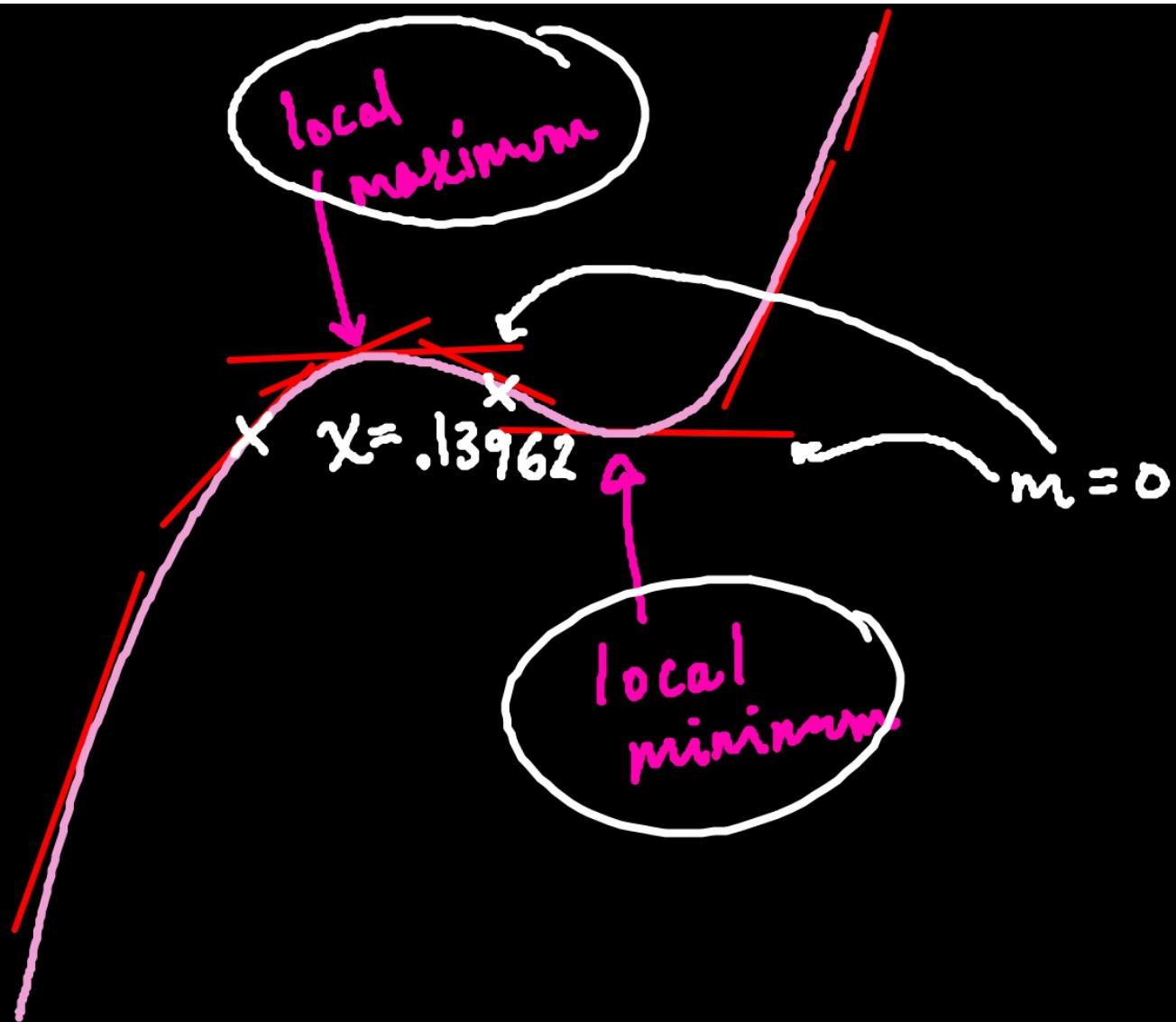


Graph the function $f(x) = 2x^3 - 4x^2 + x - 6$ on your GDC. $f'(x) = 6x^2 - 8x + 1$

Change the window: $\left[\begin{array}{l} X_{\min} = -3; X_{\max} = 4 \\ Y_{\min} = -20; Y_{\max} = 8 \end{array} \right]$
 $x = .13962$

Draw this on your graphing board if you think it will help you answer... ---> $7x^0$

Determine whether the tangent lines on the curve have positive, negative, or zero gradients at various points on the curve.



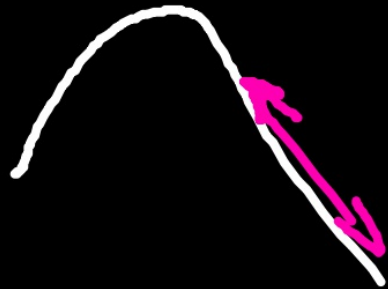
Graph of $f(x) = x^2$ and $f'(x)$.

Graph of $f(x) = x^3$ and $\frac{dy}{dx} = f'(x)$

Find $f'(x)$ for $f(x) = 3x^3 - 6x + 2$

$$f'(x) = 9x^2 - 6$$

$$\begin{aligned} f'(0) &= 9(0)^2 - 6 \\ &= -6 \end{aligned}$$



Challenge:

Calculate $f'(0)$

$f(x) = mx^2 + qx$ has point A (2,4) on the curve, and the gradient is 10 at point A.

Slope

Please find m and q.

$$f'(x) = 2mx + q$$

$$f'(2) = 2m(2) + q = 10$$

$$f(2) = m(2)^2 + q(2) = 4$$

$$q = -6$$
$$m = 4$$

$$-4m = -16$$

Find $f'(x)$ for $f(x) = \frac{1}{x}$

Challenge: $f'(x)$ for $f(x) = \sqrt{x}$