MAT137 - Calculus with proofs

- Test 1: Friday 3pm to Saturday 3pm
- Assignment #3 due on November 5

- TODAY: Definition of derivative

- FRI: Differentiation rules **(Videos 3.4, 3.5, 3.8)**
- MON: Proof of differentiation rules (Videos 3.6, 3.7, 3.9)

Tangent line to a line?

What is the equation of the line tangent to the graph of $y = x$ at the point with x–coordinate 7?

1. $y = x + 7$
2. $y = x$
3. $y = 7$
4. $x = 7$
5. There is no tangent line at that point.
6. There is more than one tangent line at that point.

True or False?

Let C be a curve. Let P be a point in C.

1. The line tangent to C at P
   intersects C at only one point: P.

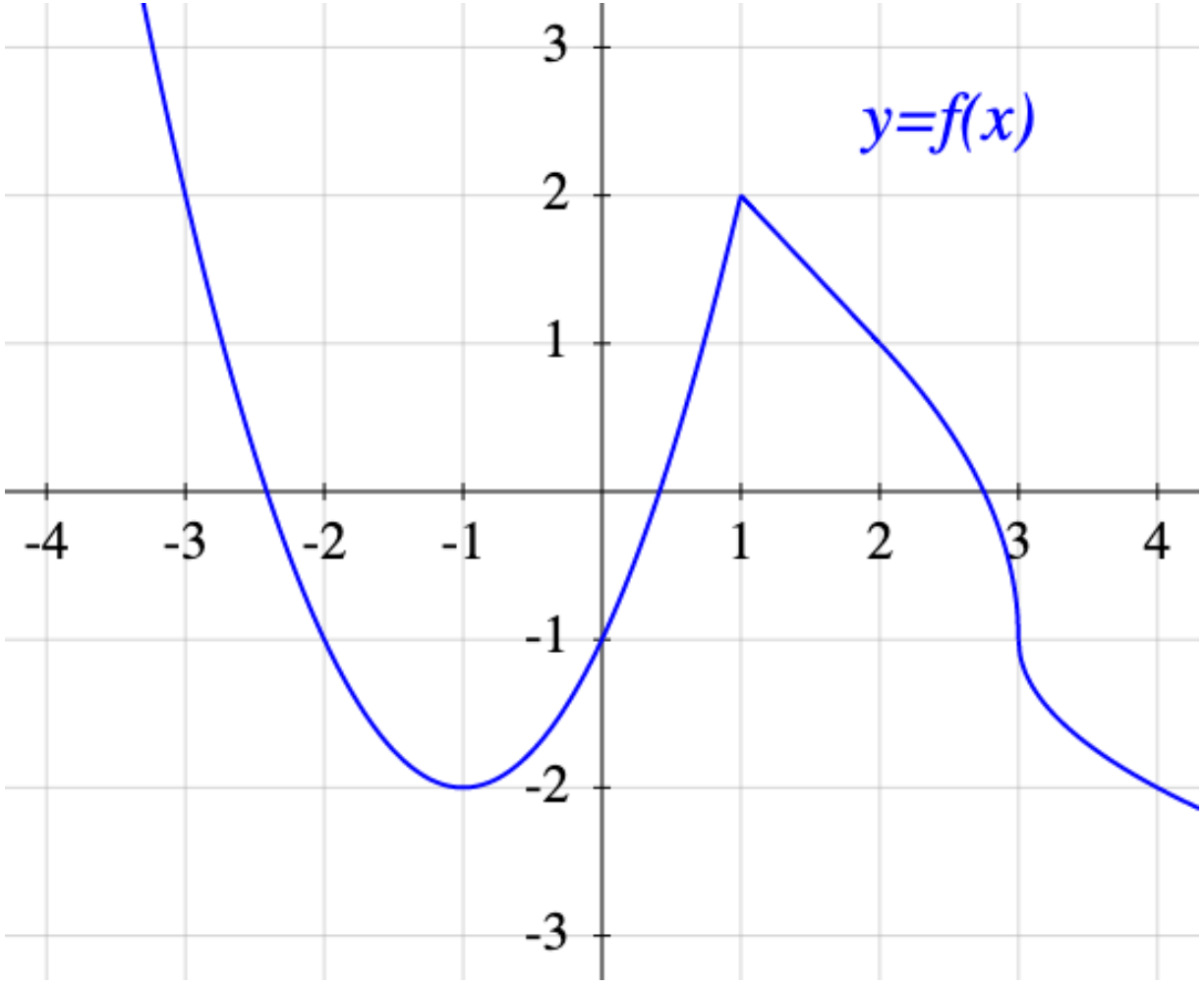
2. If a line intersects C only at P,
   then that line must be the tangent line to C at P.

3. The tangent line to C at P intersects C at P
   and "does not cross" C at P.
   (This means that, near P, it stays on one side of C.)

4. If a line intersects C at P
   and "does not cross" C at P,
   then it is the tangent line to C at P.

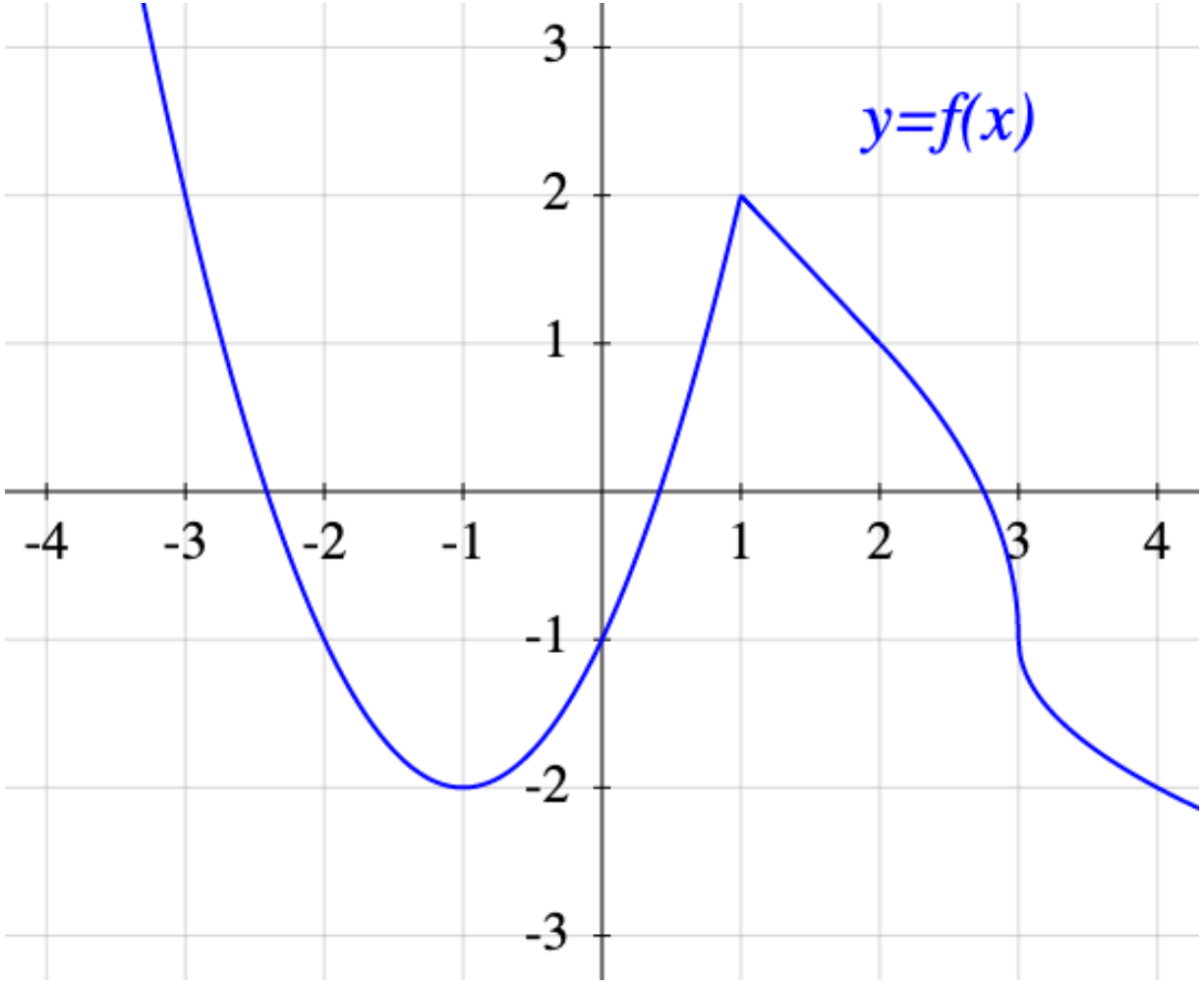
Tangent line from a graph

This is the graph of the function f. Write the equation of the line tangent to it at the point with x–coordinate -2.



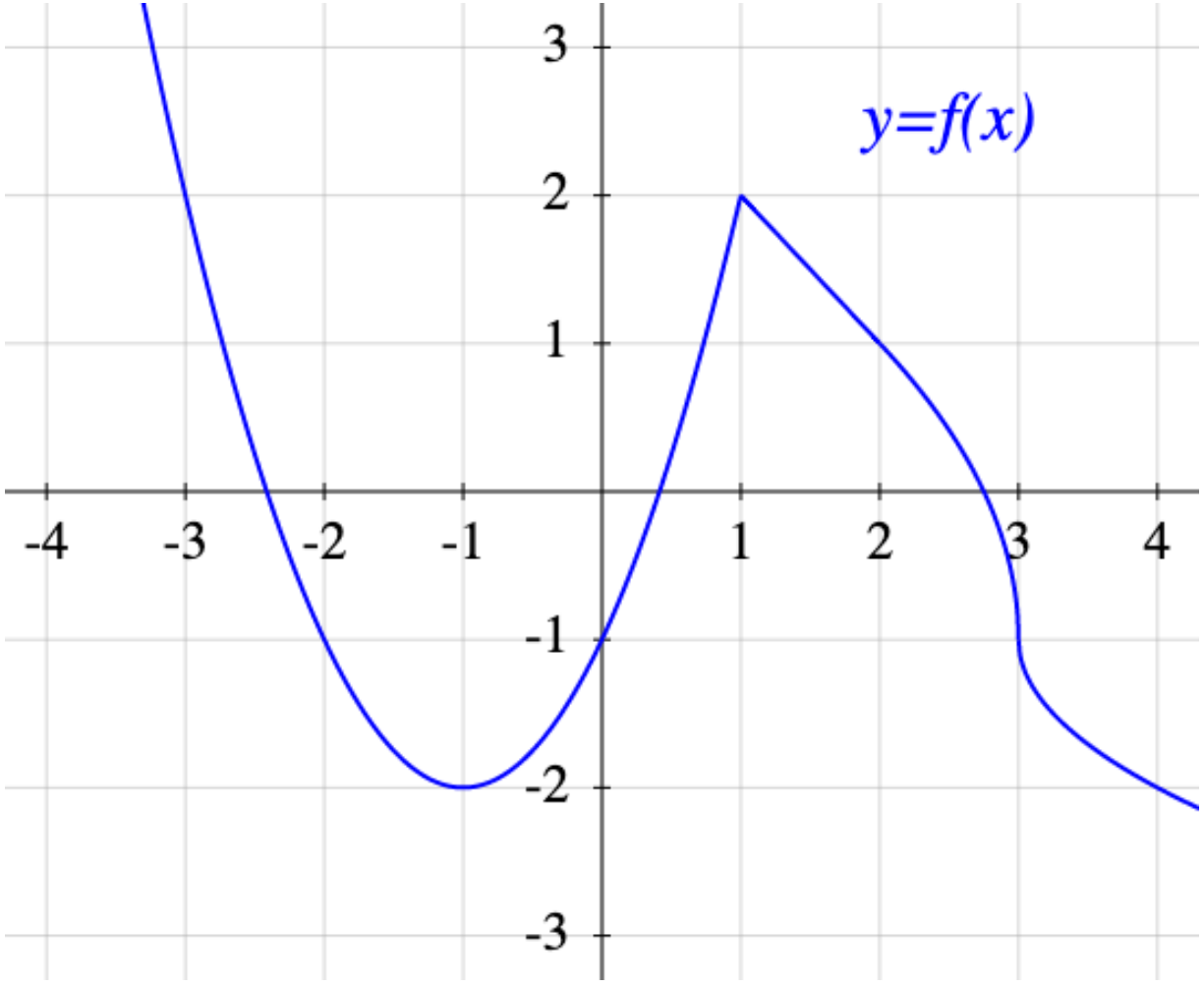
Tangent line from a graph

This is the graph of the function f. Write the equation of the line tangent to it at the point with x–coordinate -1.



Derivative from a graph

This is the graph of the function f.
Sketch the graph of its derivative f'.



Derivatives from the definition

Let $g(x) = \dfrac{2}{\sqrt{x}}$.

Calculate $g'(4)$ directly from the definition of derivative.