

## Third Quiz for Math 31

1. State the Intermediate Value Theorem.

2. Let  $f(t) = t + t^{-1}$ . A particle moves along a straight line with equation of motion  $s = f(t)$ , where  $s$  is measured in meters and  $t$  in seconds. Find the velocity of the particle for  $t = \frac{1}{2}$ ,  $t = 1$ , and  $t = 2$ .

**Hint.** Don't do three calculations. Find a formula for the velocity and then plug the values.

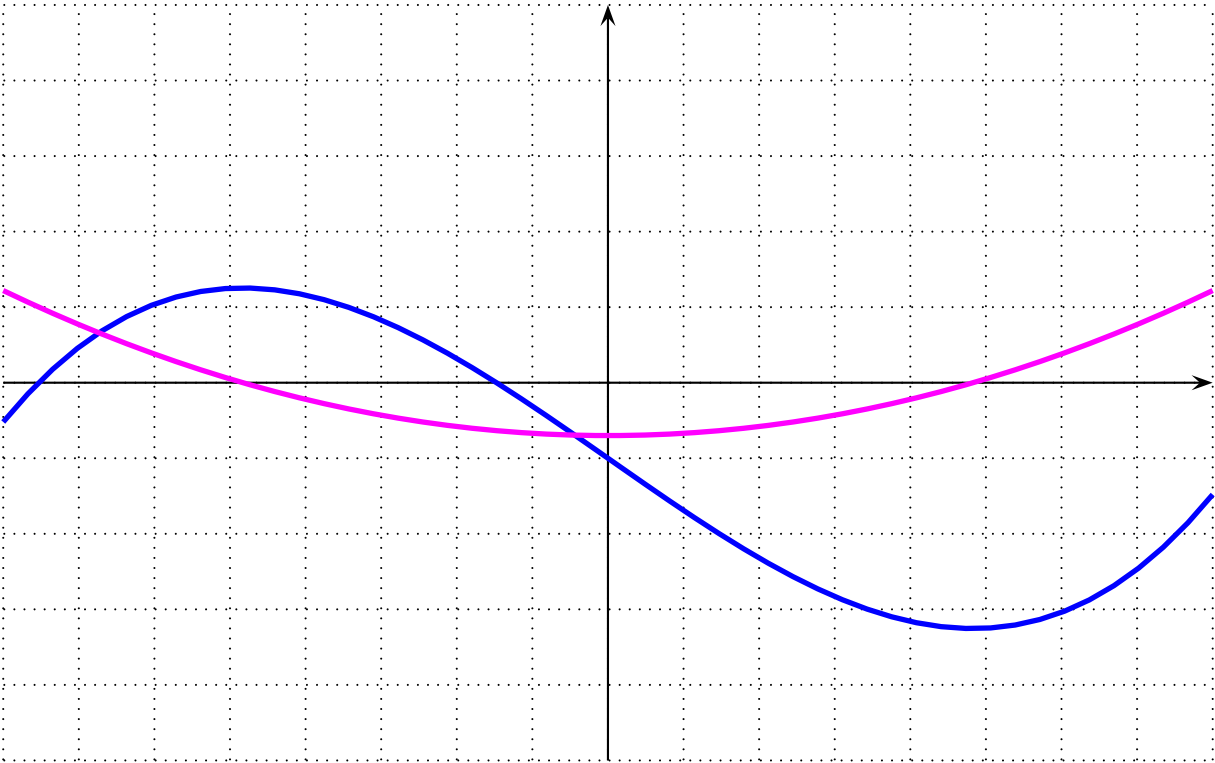
3. Let

$$f(x) = \sqrt{x - 3}$$

(a) Use the definition of the derivative as a limit to find  $f'(x)$ .

(b) Find the tangent line to the graph of  $y = f(x)$  at the point with coordinate  $x = 12$ .

4. The graph of a function  $f$  and its derivative  $f'$  are shown below. Identify which graph is which.



**NOTE:** Do one of questions 2 or 3, not both.