

■ Obtaining the graph of  $f'$  from the graph of  $f$ .

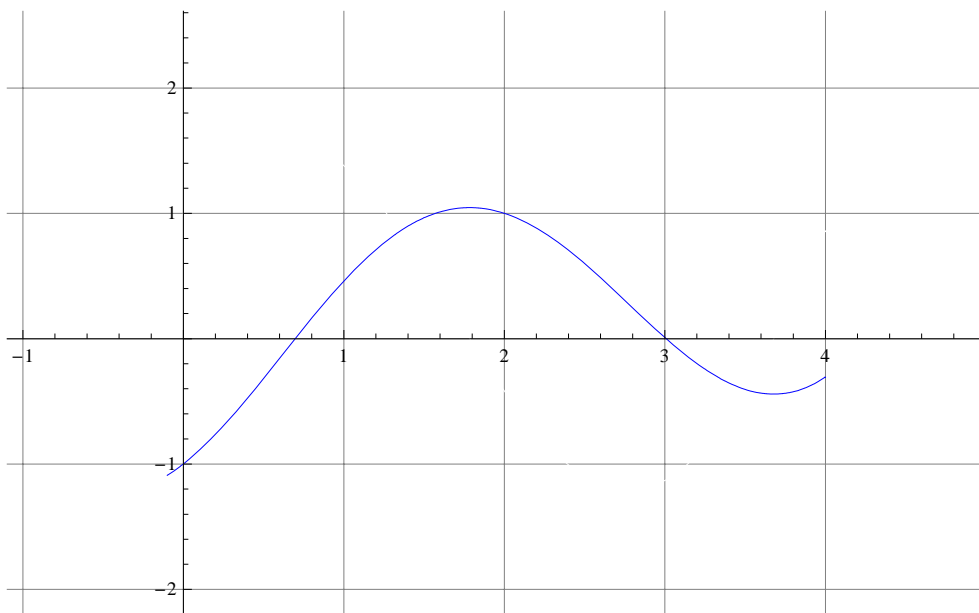
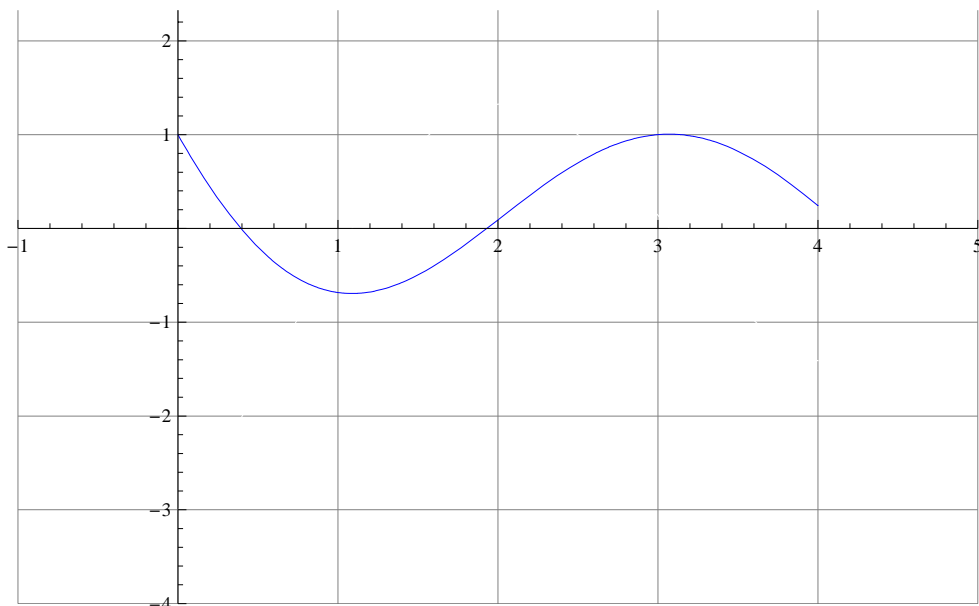
The slope of  $f(x)$  at  $x = a$  equals  $f'(a)$ .

(The slope of  $f(x)$  at  $x = a$  is zero)  $\iff f'(a) = 0$

(The slope of  $f(x)$  at  $x = a$  is positive)  $\iff f'(a) > 0 \iff f'(a)$  is above the x-axis.

(The slope of  $f(x)$  at  $x = a$  is negative)  $\iff f'(a) < 0 \iff f'(a)$  is below the x-axis.

1. Mark on the x-axis the values of  $x$  where  $f$  has zero slope.
2. Between locations where  $f$  has zero slope, mark on the x-axis where the slope of  $f$  is steepest. Get a numerical estimate of the slope at each of these points by sketching a tangent.
3. Sketch  $f'(x)$ .



3.1 : 1, 2, 3 – 41 (odd), 46, 49, 51, 55, 59, 63, 71, 78

3.2 : 1, 2, 3 – 33 (odd), 37, 39, 43, 45, 47, 51, 54

3.3 : 1 – 23 (odd), 33, 35, 37, 39, 41

3.4 : 1 – 53 (odd), 61, 65, 73, 77, 89

3.5 : 1 – 27 (odd), 37, 45, 47, 63, 69

3.6 : 1 – 33 (odd), , 37, 43, 49, 50

3.7 : 1 – 23 (odd), 27, 29

3.8 : 1, 3, 5, 7, 9, 15, 17

3.9 : 1, 5, 10, 11 – 14, 15, 19, 23, 25, 30, 40, 43, 44

3.10 : 1, 3, 15, 19, 23, 31, 35, 43