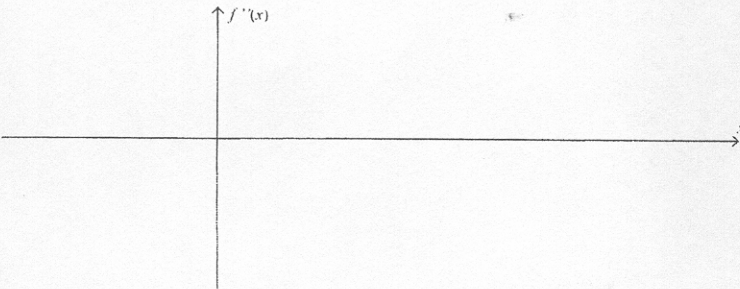
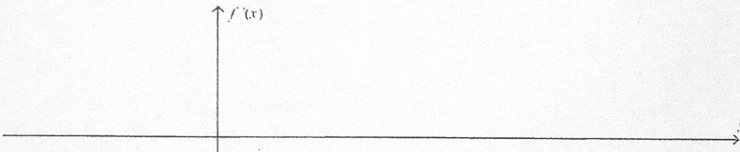
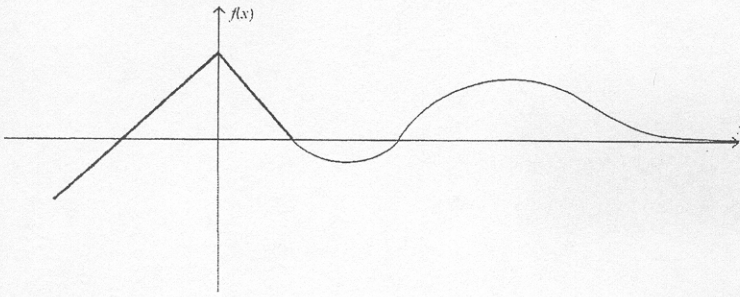


- 4) Given the graph of the function  $y = f(x)$  as shown, graph its first and second derivatives on the given axes, marking all noteworthy points appropriately.



- (5) Find derivatives of the following functions using any method.

(a)  $f(x) = \frac{1}{\sqrt{x}}((\sqrt{x})^5 + 1)$

(b)  $f(x) = x^3 \cos 5x$

(c)  $f(x) = \frac{\sin x}{3x + 2}$

- (6) Find the equation of the tangent line to the curve  $x^2y + 2y^3 = 3x + 2y + 54$  at the point where  $(x, y) = (2, 3)$ .

- (7) A particle moves with displacement  $s(t) = 16(1 - \frac{1}{t+1})$  meters.

(a) Find the average velocity from  $t = 1$  to  $t = 3$ .

(b) Find the instantaneous velocity at  $t = 3$ .

- 8) Given that the side length of a cube is known to be 8 centimeters with a possible error of  $\pm 2\%$ , use linear approximation to estimate the percentage error in the surface area of the cube.