

(1.-8) Find the derivative for each of the following.

1.) $f(x) = \pi$

2.) $g(x) = x$

3.) $h(x) = 5x^4 + 3x^2 - 2x + 1$

4.) $k(x) = \frac{3}{x^2} + \sqrt[3]{x^2}$

5.) $F(x) = (x^5 + 3x^4 - 2x + 71)\left(\frac{1}{x} - \frac{3}{\sqrt{x}}\right)$

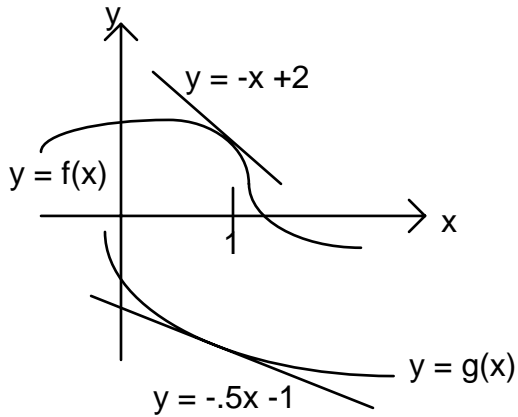
6.) $G(x) = \frac{x^2 - x + 1}{3x + 8}$

7.) $K(x) = (7x^8 - 2\sqrt{x})^5$

8.) $H(x) = \frac{(x^3 - 2x)^5}{\sqrt{7x^4 - 3x + 2}}$

Applications:

9.) The graphs of the functions $y = f(x)$ and $y = g(x)$ together with the tangent lines at $x = 1$ are shown in the picture. If $F(x) = f(x) + g(x)$, find $F(1)$ and $F'(1)$.



10.) Find the equation of the line that is tangent to the function

$$f(x) = 3x^2 + 2x - 1 \text{ at } x = 1.$$

11.) The annual revenue $R(x)$ from the sales of portable television sets is given by the equation $R(x) = 150x - x^2$ where x equals the number of units sold.

(a.) Find $R'(x)$, the marginal revenue.

(b.) Find $R'(25)$, the marginal revenue when $x = 25$.