

5A worksheet - DIFFERENTIATION

Find $\frac{dy}{dx}$. Simplify answers. Do not leave any negative exponents or complex fractions. Combine fractions.

$$(1) y = \sqrt{x}(x^2 + \sqrt{x})$$

$$y' = \frac{5}{2}x^{3/2} + 1$$

$$(2) y = \sin^2(3x) + \cot x + x - 3$$

$$y' = 6 \sin 3x \cos 3x - \csc^2 x + 1$$

$$(3) y = \frac{\sqrt[3]{x}}{1+x}$$

$$y' = \frac{1 - 8x^3}{3x^{2/3}(1+x^3)}$$

$$(4) y = \frac{2 \tan x + 1}{x}$$

$$y' = \frac{2x \sec^2 x - 2 \tan x - 1}{x^2}$$

$$(5) y = x \cos|x|$$

$$y' = -|x| \sin|x| + \cos|x|$$

$$(6) y = \frac{x^2}{\sqrt{4-x^2}}$$

$$y' = \frac{8x - x^3}{(4-x^2)^{3/2}}$$

$$(7) \sqrt{x} + \sqrt{y} = 4$$

$$y' = \frac{-\sqrt{y}}{\sqrt{x}}$$

$$(8) \frac{4x^2 - 5}{\sqrt{x}}$$

$$y' = \frac{12x^2 + 5}{2x^{3/2}}$$