SATPREP

Assignment : Power rule and Chain Rule

Differentiate each function with respect to x.

1) $y = -5\sqrt[4]{x} - 4x^{\frac{1}{5}}$

2) $y = -\frac{4}{x} + 4x^{-3}$

3) $y = -\frac{3}{x} + 3x^{-4}$

4) $y = 3x^{\frac{2}{5}} + \frac{3}{x^2}$

5) $y = (3x^4 + 5)^{-5}$

6) $y = (2x^3 + 1)^4$

7) $y = \sqrt[3]{3x^4 + 1}$

8) $y = (5x^2 + 2)^{-3}$

9) $y = \sqrt[4]{x^3 + 4}$

10) $y = (x^2 + 2)^{-5}$

Answers to Assignment : Power rule and Chain Rule

1) $\frac{dy}{dx} = -\frac{5}{4x^{\frac{3}{4}}} - \frac{4}{5x^{\frac{4}{5}}}$

2) $\frac{dy}{dx} = \frac{4}{x^2} - \frac{12}{x^4}$

3) $\frac{dy}{dx} = \frac{3}{x^2} - \frac{12}{x^5}$

4) $\frac{dy}{dx} = \frac{6}{5x^{\frac{3}{5}}} - \frac{6}{x^3}$

5) $\frac{dy}{dx} = -5(3x^4 + 5)^{-6} \cdot 12x^3$

$= -\frac{60x^3}{(3x^4 + 5)^6}$

6) $\frac{dy}{dx} = 4(2x^3 + 1)^3 \cdot 6x^2$

$= 24x^2(2x^3 + 1)^3$

7) $\frac{dy}{dx} = \frac{1}{3}(3x^4 + 1)^{-\frac{2}{3}} \cdot 12x^3$

$= \frac{4x^3}{(3x^4 + 1)^{\frac{2}{3}}}$

8) $\frac{dy}{dx} = -3(5x^2 + 2)^{-4} \cdot 10x$

$= -\frac{30x}{(5x^2 + 2)^4}$

9) $\frac{dy}{dx} = \frac{1}{4}(x^3 + 4)^{-\frac{3}{4}} \cdot 3x^2$

$= \frac{3x^2}{4(x^3 + 4)^{\frac{3}{4}}}$

10) $\frac{dy}{dx} = -5(x^2 + 2)^{-6} \cdot 2x$

$= -\frac{10x}{(x^2 + 2)^6}$