Question #27505

1. Determine the derivative of the following functions, and simplify.

a)f(x)=2x^2(3x^3−4)

b)y=1/(5x-1)^3

c) g(x) = (2x^2 - 3)^(1/3)

Solution.

$a)\ f(x) = 2x^2(3x^3 - 4) = 6x^5 - 8x^2.$

$f^{'}(x) = 30x^4 - 16x.$

$b)\ y\ = \frac{1}{(5x-1)^3}.$

$y^{'} = \frac{-3 \cdot 5}{(5x-1)^4} = -\frac{15}{(5x-1)^4}.$

$c)\ g(x) = \ (2x^2 - 3)^{\frac{1}{3}}.$

$g^{'}(x) = \frac{1}{3}(2x^2 - 3)^{-\frac{2}{3}} \cdot 4x = \frac{4x}{3\sqrt[3]{(2x^2-3)^2}}.$

Answer. $f^{'}(x) = 30x^4 - 16x,\ y^{'} = \frac{-15}{(5x-1)^4},\ g^{'}(x) = \frac{4x}{3\sqrt[3]{(2x^2-3)^2}}.$