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**21-120: Differential and Integral Calculus**  
**Recitation #7 Outline: 09/03/24**

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1. Find the derivative of the given functions.

(a)  $q(x) = \frac{5x^2}{4x+3},$

(b)  $s(t) = \frac{\sqrt[3]{t}}{t-5},$

(c)  $p(x) = 2x^5(4x^2 + x).$

2. Find the derivative of

$$f(x) = 10\sqrt[5]{x^3} - \sqrt{x^7} + 6\sqrt[3]{x^8} - 3,$$

and the derivative of

$$g(y) = \frac{y^5 - 5y^3 + 2y}{y^3}.$$

3. Find the equation of the line passing through the point  $P(3,3)$  (meaning that  $x = 3$  and  $y = 3$ ) and tangent to the graph of  $f(x) = \frac{6}{x-1}$ .
4. For  $p(x) = f(x)g(x)$ , use the Product rule to find  $p'(2)$  if  $f(2) = 3$ ,  $f'(2) = -4$ ,  $g(2) = 1$  and  $g'(2) = 6$ .
5. For

$$k(x) = 3h(x) + x^2g(x),$$

find  $k'(x)$ .

6. For  $k(x) = f(x)g(x)h(x)$ , express  $k'(x)$  in terms of  $f(x)$ ,  $g(x)$ ,  $h(x)$  and their derivatives.