

Continue Sections 4.3 & 4.4 Fractional

Coming up: **Example** $\left(\frac{(2x-1)^4 (5x+2)^4}{(3x-7)^8} \right)^{3/4}$

Step 1 Use power rule, so $\frac{3}{4} \left(\frac{(2x-1)^4 (5x+2)^4}{(3x-7)^8} \right)^{3/4-1}$
leave alone find derivative simplify

Step 2 Find $\frac{d}{dx}$ of \dots inside () only.

so $\frac{d}{dx} \left(\frac{(2x-1)^4 (5x+2)^4}{(3x-7)^8} \right)$

Example: $h(x) = \left(\frac{(2x+3)^{3/4}}{\sqrt{5x-1}} \right)^{1/2}$

Step 1 Apply outside power by everything inside
 so $\frac{(2x+3)^{3/4 \cdot 1/2}}{(5x-1)^{1/2 \cdot 1/2}} = \frac{(2x+3)^{3/8}}{(5x-1)^{1/4}}$

Step 2 Choose a rule:

As Quotient Rule = leave as is
 ** As Product Rule = $(2x+3)^{3/8} \cdot (5x-1)^{-1/4}$ ** Formula: $f'g + g'f$

Step 3 Find $f = (2x+3)^{3/8}$ and $g = (5x-1)^{-1/4}$
Step 4 Find $f' = \frac{3}{8}(2x+3)^{3/8-1} \cdot 2$ and $g' = \frac{-1}{4}(5x-1)^{-1/4-1} \cdot 5$
 $f' = \frac{3}{4}(2x+3)^{-5/8}$ and $g' = -\frac{5}{4}(5x-1)^{-5/4}$

Step 5 $\frac{3}{4}(2x+3)^{-5/8} (5x-1)^{-1/4} + \frac{5}{4}(5x-1)^{-5/4} (2x+3)^{3/8}$ *Calculus* Part Done

Step 6 Take out common factors:
 $= \frac{1}{4} (2x+3)^{-5/8} (5x-1)^{-5/4} [3(5x-1) - 5(2x+3)]$

Step 7 Clean up $15x-3-10x-15 = 5x-18$

Step 8 Final answer: $\frac{5x-18}{4(2x+3)^{5/8}(5x-1)^{5/4}}$