

$$8. \int \sec^4(5x-2) dx$$

$$\int \sec^2(5x-2) \underbrace{\sec^2(5x-2)}_{\text{SAVE}} dx$$

RECALL

$$1 + \tan^2 x = \sec^2 x$$

$$\int (1 + \tan^2(5x-2)) \sec^2(5x-2) dx$$

$$\int \sec^2(5x-2) dx + \int (\tan(5x-2))^2 \sec^2(5x-2) dx$$

$u = 5x-2$
 $du = 5 dx$

$w = \tan(5x-2)$
 $dw = \sec^2(5x-2) \cdot 5 dx$

$$\frac{1}{5} \int 5 \sec^2(5x-2) dx + \frac{1}{5} \int 5 (\tan(5x-2))^2 \sec^2(5x-2) dx$$

$$\frac{1}{5} \int \sec^2 u du + \frac{1}{5} \int w^2 dw$$

$$\frac{1}{5} \tan u + \frac{1}{5} \cdot \frac{1}{3} w^3 + C$$

$$\frac{1}{5} \tan(5x-2) + \frac{1}{15} (\tan(5x-2))^3 + C$$