

NAME: \_\_\_\_\_

Evaluate

$$\int_1^5 x(3x+2)^8 dx$$

Let  $u = 3x+2$

$$\int_{a=5}^{b=17} \left(\frac{u-2}{3}\right)(u^8) \frac{du}{3}$$

$$\frac{1}{9} \int_5^{17} u^9 - 2u^8 du$$

$$\frac{1}{9} \frac{1}{10} (17^{10} - 5^{10}) - \frac{1}{9} \frac{2}{9} (17^9 - 5^9)$$

$$17^9 \left( \frac{17(9) - 2(10)}{9(10)9} \right) - 5^9 \left( \frac{5(9) - 2(10)}{9(10)9} \right)$$

$$17^9 \left( \frac{133}{810} \right) - 5^9 \left( \frac{25}{810} \right)$$