

Name : \_\_\_\_\_

Score : \_\_\_\_\_

Teacher : \_\_\_\_\_

Date : \_\_\_\_\_

## Integration by Substitution

Find each indefinite integral using the substitution provided.

1) 
$$\int \left( \frac{40x + 35}{4x^2 + 7x} \right) dx$$

$$u = 4x^2 + 7x$$

2) 
$$\int \left( \frac{-75x^4 - 108x^3}{5x^5 + 9x^4} \right) dx$$

$$u = 5x^5 + 9x^4$$

3) 
$$\int \left( \frac{16 + 20x^4}{8x + 2x^5} \right) dx$$

$$u = 8x + 2x^5$$

4) 
$$\int \left( \frac{-160x^3 - 64x}{10x^4 + 8x^2} \right) dx$$

$$u = 10x^4 + 8x^2$$

5) 
$$\int \left( \frac{25 + 25x^4}{5x + x^5} \right) dx$$

$$u = 5x + x^5$$

6) 
$$\int \left( \frac{-140x^3 - 20x}{7x^4 + 2x^2} \right) dx$$

$$u = 7x^4 + 2x^2$$

7) 
$$\int \left( \frac{72x^2 + 80x^3}{6x^3 + 5x^4} \right) dx$$

$$u = 6x^3 + 5x^4$$

8) 
$$\int \left( \frac{90x^2 + 192x^3}{5x^3 + 8x^4} \right) dx$$

$$u = 5x^3 + 8x^4$$



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## Integration by Substitution

Find each indefinite integral using the substitution provided.

$$9) \int \left( \frac{315x^4 + 140x^3}{9x^5 + 5x^4} \right) dx$$

$$u = 9x^5 + 5x^4$$

$$10) \int \left( \frac{60x^2 + 40}{5x^3 + 10x} \right) dx$$

$$u = 5x^3 + 10x$$

$$11) \int \left( \frac{210x^2 + 35x^4}{10x^3 + x^5} \right) dx$$

$$u = 10x^3 + x^5$$

$$12) \int \left( \frac{-32x - 20}{4x^2 + 5x} \right) dx$$

$$u = 4x^2 + 5x$$

$$13) \int \left( \frac{-30x - 36x^2}{5x^2 + 4x^3} \right) dx$$

$$u = 5x^2 + 4x^3$$

$$14) \int \left( \frac{-175x^4 - 40x}{7x^5 + 4x^2} \right) dx$$

$$u = 7x^5 + 4x^2$$

$$15) \int \left( \frac{24x^3 + 20}{3x^4 + 10x} \right) dx$$

$$u = 3x^4 + 10x$$

$$16) \int \left( \frac{-30x^2 - 6}{10x^3 + 6x} \right) dx$$

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1)  $\int \left( \frac{40x + 35}{4x^2 + 7x} \right) dx$

$$u = 4x^2 + 7x$$

$$5 \ln | 4x^2 + 7x | + C$$

2)  $\int \left( \frac{-75x^4 - 108x^3}{5x^5 + 9x^4} \right) dx$

$$u = 5x^5 + 9x^4$$

$$-3 \ln | 5x^5 + 9x^4 | + C$$

3)  $\int \left( \frac{16 + 20x^4}{8x + 2x^5} \right) dx$

$$u = 8x + 2x^5$$

$$2 \ln | 8x + 2x^5 | + C$$

4)  $\int \left( \frac{-160x^3 - 64x}{10x^4 + 8x^2} \right) dx$

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$$-4 \ln | 10x^4 + 8x^2 | + C$$

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$$-5 \ln | 7x^4 + 2x^2 | + C$$

7)  $\int \left( \frac{72x^2 + 80x^3}{6x^3 + 5x^4} \right) dx$

$$u = 6x^3 + 5x^4$$

$$4 \ln | 6x^3 + 5x^4 | + C$$

8)  $\int \left( \frac{90x^2 + 192x^3}{5x^3 + 8x^4} \right) dx$

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16) 
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$$u = 10x^3 + 6x$$

$$-\ln|10x^3 + 6x| + C$$

