

Name _____

1) Find the integral below.

$$\int \frac{4x^2 - 7x - 12}{x(x+2)(x-3)} dx$$

$$\frac{4x^2 - 7x - 12}{x(x+2)(x-3)} = \frac{A}{x} + \frac{B}{x+2} + \frac{C}{x-3}$$

$$4x^2 - 7x - 12 = A(x+2)(x-3) + B(x)(x-3) + C(x)(x+2)$$

When $x = 0$:

$$-12 = -6A$$

$$A = 2$$

When $x = -2$:

$$18 = 10B$$

$$B = \frac{9}{5}$$

When $x = 3$:

$$3 = 15C$$

$$C = \frac{1}{5}$$

$$\int \frac{4x^2 - 7x - 12}{x(x+2)(x-3)} dx = \int \frac{2}{x} + \frac{9}{5} \frac{1}{x+2} + \frac{1}{5} \frac{1}{x-3} dx = 2 \ln|x| + \frac{9}{5} \ln|x+2| + \frac{1}{5} \ln|x-3|$$

2) Use the midpoint rule to approximate the integral to $\int_0^3 f(x)dx$. Write out your formula, but you do not need to find the final answer.

$$n = 3$$

$$\Delta x = 1$$

Answer:

$$1 \cdot 2 + 1 \cdot 5 + 1 \cdot 13 = 20$$

x	$f(x)$
0	1
0.5	2
1	3
1.5	5
2	8
2.5	13
3	21