

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

DATE: 02/07/2018

**ASSIGNMENT: Finding "C" (the constant) during Integration**

1.) The curve  $y = f(x)$  has a maximum at (3, 9). [SL non-calc]

Given that  $f''(x) = \frac{x^2}{3} - 2$ , find  $f(x)$ .

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2.) If  $f'''(x) = 12$  and there is a point of inflection at  $f(1)$ , find  $f''(x)$ . [SL non-calc]

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3.) Given  $\int_3^k \frac{1}{x-2} dx = \ln 7$ , find the value of  $k$ . [SL non-calc]

Note:  $\int (1/x) dx = \ln x$

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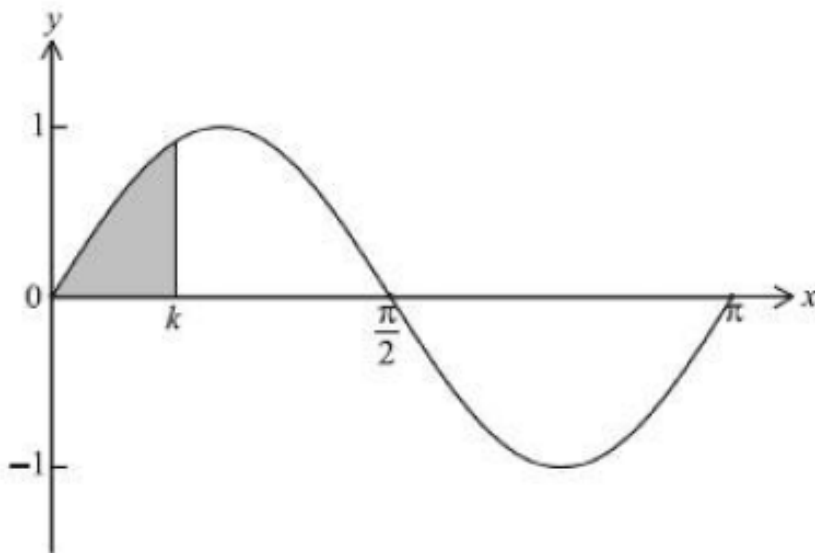
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4.) CHALLENGE \*\*\*optional fun\*\*\*

[SL-calc]

The graph of  $y = \sin 2x$  from  $0 \leq x \leq \pi$  is shown below.



The area of the shaded region is 0.85. Find the value of  $k$ .

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**Answer key:**

$$1) f(x) = \frac{x^4}{36} - x^2 + 3x + \frac{27}{4}$$

You'll need to take the integral once to get back to the derivative.

At maximums, the gradient of the tangent is 0.

You'll then take the integral one more time to get back to the original function. At that point, you can use the given coordinate to identify C.

$$2) f''(x) = 12x - 12$$

$$3) k = 9$$

$$4) k = 1.17$$