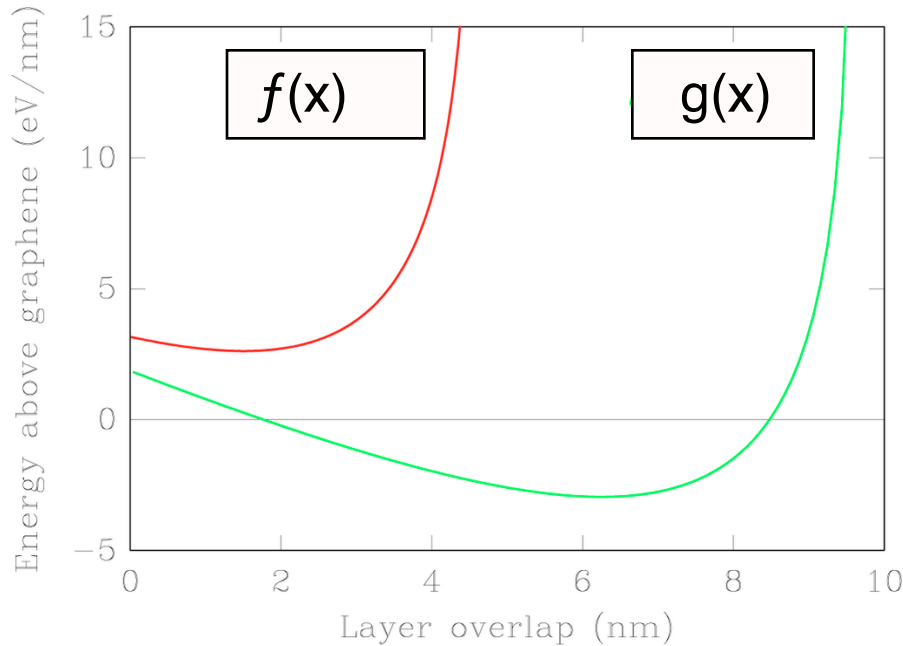


**ASSIGNMENT: Finding Area Between Curves**

**DIRECTIONS:** To find the area between curves, calculate the total area of the bigger curve and subtract the area of the smaller curve.

If you have overlapping curves  $f(x)$  and  $g(x)$  below, you can find the area by subtracting the smaller area from the larger area within your boundaries. In this example, we'll find the area between the two curves from  $[0, 1]$ .

Area between curves =  $\int [f(1)dx - f(0)dx] - \int [g(1)dx - g(0)dx]$



1.) Let  $f(x) = \cos(x^2)$  and  $g(x) = e^x$ , for  $-1.5 \leq x \leq 0.5$ . [SL-calc]

i) Find the area of the region enclosed by the graphs of  $f$  and  $g$ .

(Total 6 marks)

(Find = obtain an answer by showing relevant stages of working)

---



---



---



---



---



---



---

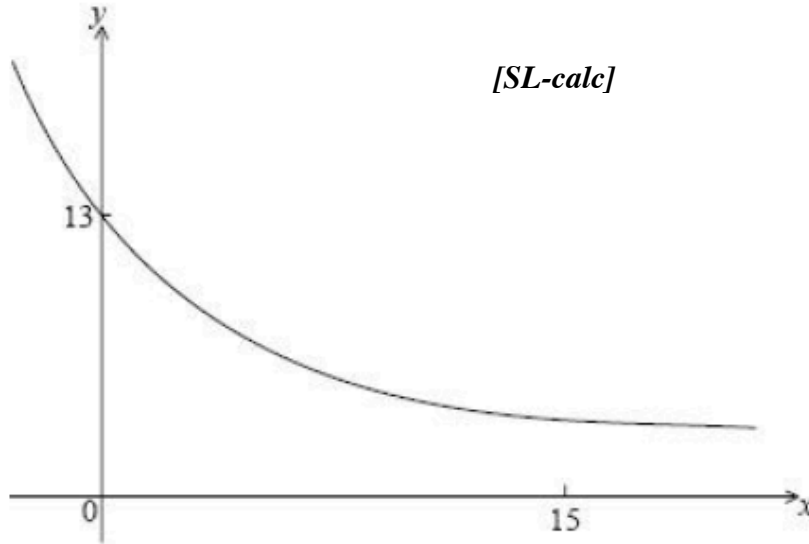
NAME: \_\_\_\_\_

DATE: 02/13/2018

Let  $f(x) = Ae^{kx} + 3$ . Part of the graph of  $f$  is shown below.

2.)

[SL-calc]



The y-intercept is at  $(0, 13)$ .

- (a) Show that  $A = 10$ . (2)
- (b) Given that  $f(15) = 3.49$  (correct to 3 significant figures), find the value of  $k$ . (3)
- (c) (i) Using your value of  $k$ , find  $f'(x)$ .
- (ii) Hence, explain why  $f$  is a decreasing function.
- (iii) Write down the equation of the horizontal asymptote of the graph  $f$ . (5)

Let  $g(x) = -x^2 + 12x - 24$ .

- (d) Find the area enclosed by the graphs of  $f$  and  $g$ . (6)
- (Total 16 marks)**

---

---

---

---

---

---

---

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

DATE: 02/13/2018

**Answer key:**

- 1) Area = 0.282; find doesn't necessarily mean calculating the integrals by hand, but it does indicate you should show your steps even if the calculator is doing the heavy lifting
- 2)  $k = -0.201$   
asymptote = the line the graph approaches but doesn't cross (you can find it!)  
area = 19.5