Semester 2 Review
No Calculator

1) Suppose: $\int_{-2}^{2} f(x)dx = 4$, $\int_{2}^{5} f(x)dx = 3$, $\int_{-2}^{5} g(x)dx = 2$. Find the value of $\int_{-2}^{5} \left(f(x) + g(x)\right)dx = 9$

2) Evaluate: $\int_{0}^{1} \left(8s^3 - 12s^2 + 5\right)ds$

3) Evaluate: $\int_{1}^{2} \left(x + \frac{1}{x^2}\right)dx$

4) Evaluate: $\int_{1}^{2} \left(2x\sin\left(1 - x^2\right)\right)dx$

5) Suppose $F(x)$ is an antiderivative of $f(x) = \sqrt{1 + x^4}$. Express $\int_{0}^{1} \sqrt{1 + x^4}dx$ in terms of *F.*

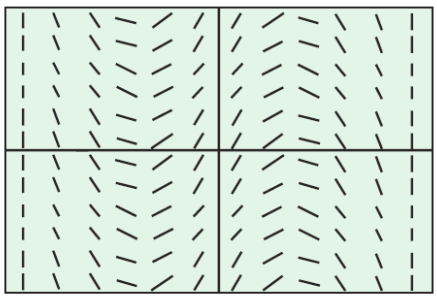
6) An automobile computer gives a digital readout of fuel consumption in gallons per hour. During a trip, a passenger recorded the fuel consumption every 5 **minutes** for a full hour of travel.

time	gal/hr
0	2.5
5	2.4
10	2.3
15	2.4
20	2.4
25	2.5
30	2.6
35	2.5
40	2.4
45	2.3
50	2.4
55	2.4
60	2.3

Use the Trapezoidal Rule to approximate the total fuel consumption during the hour. Setup, but don't evaluate. Give your answer in **gallons**.

7) Evaluate: $\int \left(e^{\tan x} \cdot \sec^2 x\right) dx$

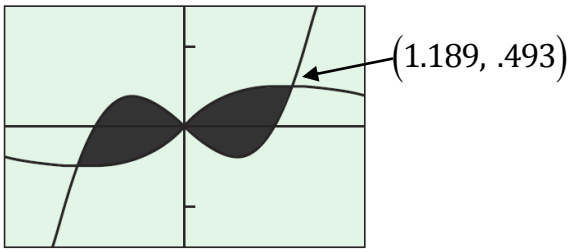
8) Draw a possible graph for the function $y = f\left(x\right)$ with slope field given in the figure that satisfies the initial condition $y\left(0\right) = 0$.



[–10, 10] by [–10, 10]

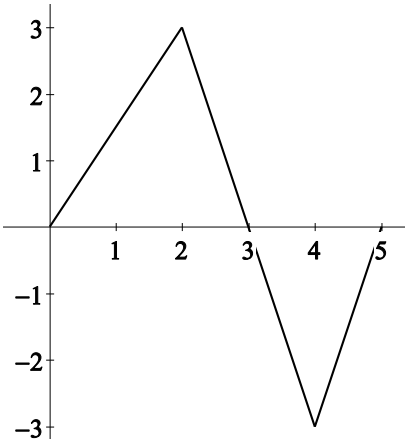
9) The intensity $L(x)$ of light x feet beneath the surface of the ocean satisfies the differential equation $\frac{dL}{dx} = -kL$ where k is a constant. As a diver you know from experience that diving to 18 ft in the Caribbean Sea cuts the intensity in half. What is the value of k?

10) Write an integral expression that will find the shaded area between $y = x^3 - x$ and $y = \frac{x}{x^2+1}$



[–2, 2] by [–1.5, 1.5]

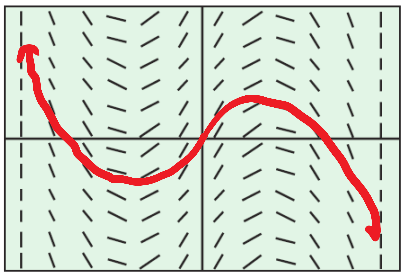
11) Below is a graph of $g(x)$. And $f(x) = \int_0^x g(t)\,dt$



$g(x)$

a) $f(2)$

b) Write the equation of the line tangent to $f(x)$ at $x = 2$.

1)	p.316 #9	9
2)	p.316 #19	3
3)	p.316 #26	2
4)	p.316 #28	0
5)	p.316 #47	$F(1)-F(0)$
6)	p.316 #51	$\frac{5}{2}[2.5+2(2.4)+2(2.3)+2(2.4)+2(2.4)+2(2.5)+2(2.6)+2(2.5)+$ $2(2.4)+2(2.3)+2(2.4)+2(2.4)+2.3]^{*}\frac{1}{60}$
7)	p.373 #7	$e^{\tan x}+c$
8)	p.373 #50	 [–10, 10] by [–10, 10]
9)	p.373 #57	$\frac{\ln\frac{1}{2}}{-18}=k$
10)	p.431 #17	$2\int_{0}^{1.189}\left(\frac{x}{x^2+1}-\left(x^3-x\right)\right)dx$
11)	Made up	a) 3 b) $y-3=3(x-2)$