Sheet #541 - Ch.5.1-5.4 Review

Name _____ Per/Sec. _____

Note: Use TI-83 whevever possible. Make sure you can do each question with or without multiple choices given. Show setup of integrals or sums.

1. **IMPORTANT:** Do Chapter 5 textbook review problems pages 273-276: 5, 6, 15, 18-23, 29, 35, 36, 40. Similiar problems will appear on the test.

2. Choose the correct statement given that $\int_0^7 f(x)\,dx = 8$ and $\int_1^7 f(x)\,dx = -3$.

   a) $\int_7^1 f(x)\,dx = -3$ b) $\int_0^1 f(x)\,dx = 5$

   c) $\int_1^0 f(x)\,dx = 11$ d) $\int_0^1 f(x)\,dx = 11$

   e) $\int_0^1 f(x)\,dx = -11$

3. On the planet Mars the population of a newly discoverd bacteria in the year 1990 was about 5 billion. If the population was growing according to $P(t) = 5e^{0.017t}$ then which definite integral gives the population for the 8-year period starting from the year 1990. Assume $t = 0$ at the beginning of the year 1990.

   a) $\int_0^8 5e^{0.017t}\,dt$ b) $8\int_0^1 5e^{0.017t}\,dt$

   c) $\int_0^1 40e^{0.017t}\,dt$ d) $\int_{1990}^{1998} 5e^{0.017t}\,dt$

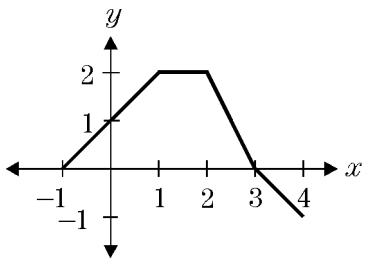
   e) $\int_0^{1998} 5e^{0.017t}\,dt$

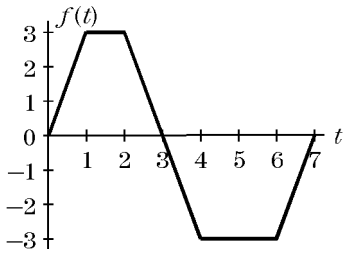
4. The graph of f is shown for $-1 \le x \le 4$. What is the value of $\int_{-1}^4 f(x)\,dx$?

   a) 4.5 b) 5.5

   c) 5 d) 4

   e) 3.5



5. 

   The graph of $f(t)$ is shown. If $F(x) = \int_0^x f(t)dt$, then fill in the values of $F(x)$ asked for in the table,

x	0	1	2	3	6	7
$F(x)$						

6. Given $\int_{-2}^7 f(x)dx = 10$ and $\int_{-2}^0 f(x)dx = -3$ then evaluate

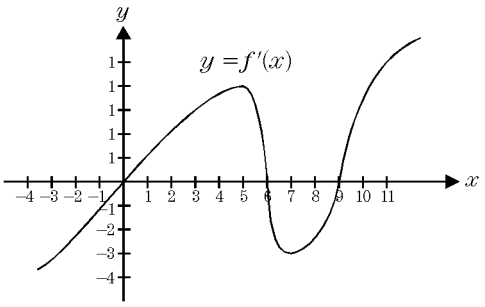
   a) $\int_0^7 f(x)dx$

   b) $\int_2^{11} f(x-4)dx$

7. A story is being heard at a rate of $R(t) = 400e^{-0.21t}$ people per week. Approximately how many people will hear the story during the seventh and eighth week?

8. The figure shows the graph of f', the derivative of the function f. The domain of the function f is $-10 \le x \le 10$.

How many points of inflection does this function have?



a) 1 b) 2 c) 3 d) 4 e) 0

9. Given $g(x) = A + h(x)$ and $\int_1^5 h(x)\,dx = A$, find the average value of $g(x)$ over the interval $[1,5]$ in terms of A.

a) $\frac{A}{3}$ b) $\frac{A}{4}$ c) $\frac{5A}{4}$ d) $4A$ e) $3A$

10. Which of the following definite integrals represents the area of the shaded region?

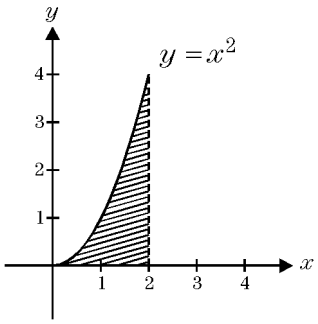
a) $\int_0^4 x^2\,dx$

b) $\int_0^2 x^2\,dx$

c) $\int_1^2 x^2\,dx$

d) $\int_0^2 x^2$

e) $\int_0^4 x^2$



11. Which of the following would yield the area of the region bounded by the graphs of $y = 2x$ and $y = 11x - x^3$?

a) $\int_{-3}^{3} (x^3 - 9x)\,dx$

b) $\int_{-3}^{3} (9x - x^3)\,dx$

c) $2\int_{0}^{3} (9x - x^3)\,dx$

d) $\int_{-3}^{0} (9x - x^3)\,dx + \int_{0}^{3} (x^3 - 9x)\,dx$

e) $2\int_{-3}^{3} (x^3 - 9x)\,dx$

12. Let R be a region in the first quadrant enclosed by the curves of $y = 10 - x^2$, $y = 3x$, and the y-axis.

Find the area of the enclosed region.

a) $\frac{17}{3}$ b) $\frac{9}{2}$ c) $\frac{34}{3}$ d) 5 e) 9

13. An object moves in a straight line with velocity $v(t) = 24t - 6t^2$.

a) How far does it travel in the first 4 seconds?

b) What is the *total* distance travelled by the object in the first 5 seconds?