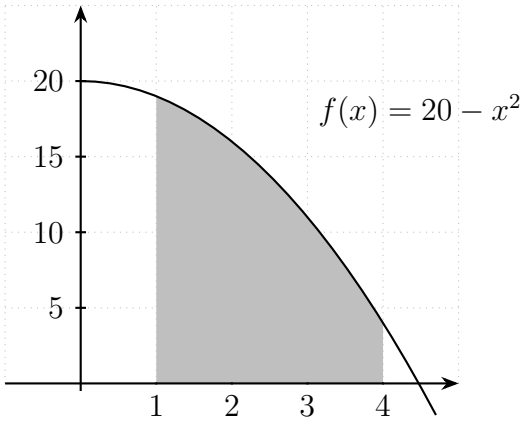
MATH 120 - Calculus 1 Name: _____

Exam 4 Version B Section: _____

Instructions: Follow all given directions. Make sure to support all answers with sufficient work, any answers proivded without work will not be elligible for partial credit, and in some instances unsupported work will not count for any credit. Basic calculators that are not capable of algebraic manipulation are permitted on this exam.

1. (6 pts) Approximate the area of the shaded region using 4 left endpoint rectangles.



2. (4 pts)

   Calculate the sum $\sum_{i=0}^{4} 4i + 2$

3. (6 pts) Calculate the exact area under the curve of $f(x) = \sqrt{9 - x^2}$ on $[0, 3]$.

4. (4 pts) Evaluate the definite integral $\int_3^{12} (2f(x) - g(x) + 1)\, dx$ given that: $\int_5^{12} f(x)\, dx = 9$, $\int_3^5 f(x)\, dx = 2$, and $\int_{12}^3 g(x)\, dx = 8$.

5. (8 pts each) Evaluate the following indefinite integrals:

   a. $\int 4x^{3/2} - \frac{2}{x^3} + \frac{4}{x}\, dx$

   b. $\int 6x^2 \left(3x^3 + 1\right)^7\, dx$

c. $\int 6x \sin(x^2)\, dx$

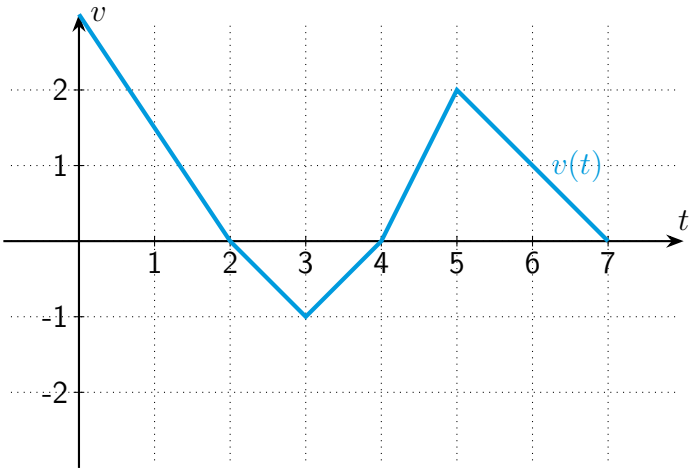
d. $\int \frac{2x^3 - 3x^2}{x^4 - 2x^3 + 1}\, dx$

e. $\int \frac{9}{\sqrt{25 - 4x^2}}\, dx$

f. $\int 3\tan(4x)\, dx$

6. (8 pts) Evaluate the definite integral: $\int_0^4 \sqrt{2x+1}\, dx$

7. (8 pts) The graph below shows the velocity function $v(t)$ in meters per second for an object moving along a horizontal axis. Use the graph to answer the questions that follow.



a. Over what interval(s) of time is the object moving in the positive direction?

b. What is the position of the object at $t = 4$?

c. On what interval(s) of time is acceleration of the object negative?

d. Find the net distance traveled by the object from $t = 0$ to $t = 7$.