

Name _____

Part 1: Computational Skills. Choose 4 of the problems below to complete.

1) Find $\lim_{x \rightarrow 3} \frac{x^2 - 9}{x - 3}$.

2) Find $\lim_{x \rightarrow \infty} \frac{2x^2 + 3x - 5}{7x^2 - 4x + 6}$

3) Find the derivative of $f(x) = \sin(3x)$

4) Find the derivative of $f(x) = (x^2 + 2x)(x^6 + 5)$

5) Find $\int (x + 6)^7 dx$

6) Find $\int_1^3 x^2 dx$

Part 2: Conceptual Understanding. Choose 2 of the problems below to complete.

7) Using the graph to the right, estimate $\lim_{x \rightarrow 2^-} f(x)$

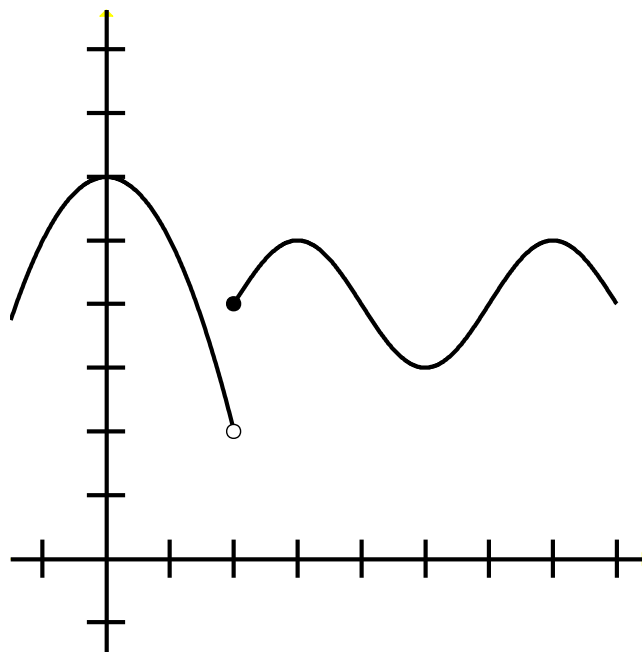
Be sure to illustrate your answer on the graph.

8) Using the graph to the right, estimate $f'(3)$

Be sure to illustrate your answer on the graph.

9) Using the graph to the right, estimate $\int_2^3 f(x) dx$

Be sure to illustrate your answer on the graph.



Part 3: Applications. Choose 1 of the problems below to complete.

10) A squirrel runs away from a toddler according to the velocity function $f(x) = 4 - x$, until it stops. How far does the toddler need to run in order to catch the squirrel?

11) A region is formed is enclosed by the curve $y = 3 - \sqrt{x}$, $x = 0$, and $y = 0$. Then A cone-like shape is constructed by rotating the region around the x -axis. What is the volume of this cone-like thing?