1. (1 pt) Find the derivative of $y = x^{-9}$.
$\frac{dy}{dx} =$ _____
Answer(s) submitted:
•
(incorrect)

2. (1 pt) Find the derivative of $y = x^{5/6}$.
$\frac{dy}{dx} =$ _____
Answer(s) submitted:
•
(incorrect)

3. (1 pt) Find the derivative of $f(x) = \frac{1}{x^{19}}$.
$f'(x) =$ _____
Answer(s) submitted:
•
(incorrect)

4. (1 pt) Find the derivative of
$y = \sqrt[3]{x}$.
$\frac{dy}{dx} =$ _____
Answer(s) submitted:
•
(incorrect)

5. (1 pt) Find the derivative of $f(t) = 5t^2 - 4t + 1$.
$f'(t) =$ _____
Answer(s) submitted:
•
(incorrect)

6. (1 pt) Find the derivative of $y = 5t^3 - 6\sqrt{t} + \frac{14}{t}$.
$\frac{dy}{dt} =$ _____
Answer(s) submitted:
•
(incorrect)

7. (1 pt) Find the derivative of $y = \sqrt{x}(x+6)$.
$\frac{dy}{dx} =$ _____
Answer(s) submitted:
•
(incorrect)

8. (1 pt) Find the derivative of $y = \frac{x^6+3}{x}$.
$\frac{dy}{dx} =$ _____
Answer(s) submitted:
•
(incorrect)

9. (1 pt) Find the derivative of $j(x) = \frac{x^{11}}{a} + \frac{a}{b}x^{10} - cx$.
Assume that a, b and c are constants.
$j'(x) =$ _____
Answer(s) submitted:
•
(incorrect)

10. (1 pt) Find the derivative of $V = \frac{5}{4}\pi r^6 b$.
Assume that b is a constant.
$\frac{dV}{dr} =$ _____
Answer(s) submitted:
•
(incorrect)

11. (1 pt) Find the equation of the line tangent to the graph of f at $(3,57)$, where f is given by $f(x) = 4x^3 - 7x^2 + 12$.
$y =$ _____
Answer(s) submitted:
•
(incorrect)

12. (1 pt) If $f(x) = x^3 + 6x^2 - 36x + 23$, find analytically all values of x for which $f'(x) = 0$. (Enter your answer as a comma separated list of numbers, e.g., -1,0,2)
$x =$ _____
Answer(s) submitted:
•
(incorrect)

13. (2 pts) The height of a sand dune (in centimeters) is represented by $f(t) = 1000 - 3t^2$ cm, where t is measured in years since 1995. Find $f(9)$ and $f'(9)$, and determine what each means in terms of the sand dune. Give the values of $f(9)$ and $f'(9)$ below, including **units**.
$f(9) =$ _____
$f'(9) =$ _____
Answer(s) submitted:
•
•
(incorrect)

14. (2 pts) At a time t seconds after it is thrown up in the air, a tomato is at a height (in meters) of $f(t) = -4.9t^2 + 55t + 2$ m.

A. What is the average velocity of the tomato during the first 5 seconds? Give **units**. _____

B. Find (exactly) the instantaneous velocity of the tomato at $t = 5$. Give **units**. _____

C. What is the acceleration at $t = 5$? (Include **units**.) _____

D. How high does the tomato go? (Include **units**.) _____

E. How long is the tomato in the air? (Include **units**.) _____

Answer(s) submitted:

-
-
-
-
-

(incorrect)

15. (2 pts) Given a power function of the form $f(x) = ax^n$, with $f'(1) = 28$ and $f'(3) = 756$, find n and a.

$n =$ _____

$a =$ _____

Answer(s) submitted:

-
-

(incorrect)