1.(1 pt) To find the length of the curve defined by

$$y = 3x^5 + 4x$$

from the point (-3,-741) to the point (4,3088), you'd have to compute

$$\int_a^b f(x)dx$$

where a=__________ ,
b=__________ ,
and f(x) = __________

2.(1 pt) Find the length of the curve defined by

$$y = 4x^{3/2} - 7$$

from $x = 2$ to $x = 8$.

3.(1 pt) Find the length of the curve defined by

$$y = 2\ln\left(\left(\frac{x}{2}\right)^2 - 1\right)$$

from $x = 4$ to $x = 7$.

4.(1 pt) Find the length of the arc formed by
$x^2 = 4y^3$
from point A to point B, where
$A = (0,0)$ and $B = (16,4)$

5.(1 pt) Find the length of the arc formed by

$$y = \frac{1}{8}\left(-2x^2 + 4\ln(x)\right)$$

from $x = 3$ to $x = 6$

6.(1 pt) Find the length of the curve

$$x = 3y^{4/3} - \frac{3}{32}y^{2/3}, \quad -343 \le y \le 27$$

$L =$ __________

7.(1 pt) Consider the parametric curve given by the equations

$$x(t) = t^2 + 11t - 32$$
$$y(t) = t^2 + 11t - 6$$

How many units of distance are covered by the point P(t) = (x(t),y(t)) between t=0, and t=10 ?

8.(1 pt) Find the length of parametrized curve given by
$x(t) = 0t^3 + 18t^2 - 18t, y(t) = -4t^3 + 6t^2 + 24t,$
where t goes from zero to one.
Hint: The speed is a quadratic polynomial with integer coefficients. __________

9.(1 pt) Let L be the circle in the x-y plane with center the origin and radius 19.
Let S be a moveable circle with radius 7 . S is rolled along the inside of L without slipping while L remains fixed.
A point P is marked on S before S is rolled and the path of P is studied.
The initial position of P is (19,0).
The initial position of the center of S is (12,0) .
After S has moved counterclockwise about the origin through an angle t the position of P is

$$x = 12\cos t + 7\cos\left(\frac{12}{7}t\right)$$
$$y = 12\sin t - 7\sin\left(\frac{12}{7}t\right)$$

How far does P move before it returns to its initial position?
Hint: You may use the formulas for cos(u+v) and sin(w /2).
S makes several complete revolutions about the origin before P returns to (19,0).

10.(1 pt) Consider the parametric equation

$$x = 7(\cos\theta + \theta\sin\theta)$$
$$y = 7(\sin\theta - \theta\cos\theta)$$

What is the length of the curve for $\theta = 0$ to $\theta = \frac{7}{4}\pi$?

11.(1 pt) If $f(\theta)$ is given by: $f(\theta) = 10\cos^3\theta$ and $g(\theta)$ is given by: $g(\theta) = 10\sin^3\theta$
Find the total length of the astroid described by $f(\theta)$ and $g(\theta)$. (The astroid is the curve swept out by $(f(\theta), g(\theta))$ as θ ranges from 0 to 2π.)

12.(1 pt) Given the equation: $xy = 10$, set up an integral to find the length of path from $x = a$ to $x = b$ and enter the integrand below. (i.e. if your integral is $L = \int_a^b \frac{c^2x^2}{h}dx$ enter $\frac{c^2x^2}{h}$ as your answer.)
$L = \int_a^b$ __________ dx

13.(1 pt) You and your best friend Janine decide to play a game. You are in a land of make believe, where you are a function f(t), and she will be a function g(t). In this make-believe land, the two of you are posing as parametric equations, (to keep other equations from interfering). As parametric equations, your joint path is dependent on decisions that each of you make. Janine decides how you will move in the North and South (y-axis) directions, and you control East and West (x-axis). If your identity, f(t) is given by:

$$f(t) = \frac{(t^2 + 38)^{\frac{3}{2}}}{3}$$

and Janine's identity, g(t) is given by:
$g(t) = 19t$
How many units of distance do the two of you cover between the Most Holy Point o' Beginnings (t=0), and The Buck Stops Here (t=27)?

14.(1 pt) A cable hangs between two poles of equal height and 34 feet apart.
At a point on the ground directly under the cable and
x feet from the point on the ground halfway between the poles the height of the cable in feet is

$$h(x) = 10 + (0.5)(x^{1.5}).$$

The cable weighs 12.4 pounds per linear foot.
Find the weight of the cable.