Name: _____

CLASSWORK 107

Find the antiderivative of each function.

1. $y = 2x^{1/2} - 1/x^3$

2. $y = 5 \cos x + 5 \sin x$

3. $y = \dfrac{\sin x}{\sqrt{\cos x}}$

4. An object is moving according to the equation $y = (\ln x)^5$ where x represents time in seconds and y represents displacement in meters.

a) Find the object's position after 3 seconds.

b) Find the object's average velocity between t = 3 seconds and t = 3.1 seconds.

c) Find the object's instantaneous velocity at t = 3 seconds.

5. The **velocity** of an object over time is described by the equation y = 4 where y represents velocity in meters per second and x represents time in seconds.

a) Sketch a graph of velocity over time.

b) Write an equation for the object's **distance** as compared to time. How is this geometrically represented on the graph above?

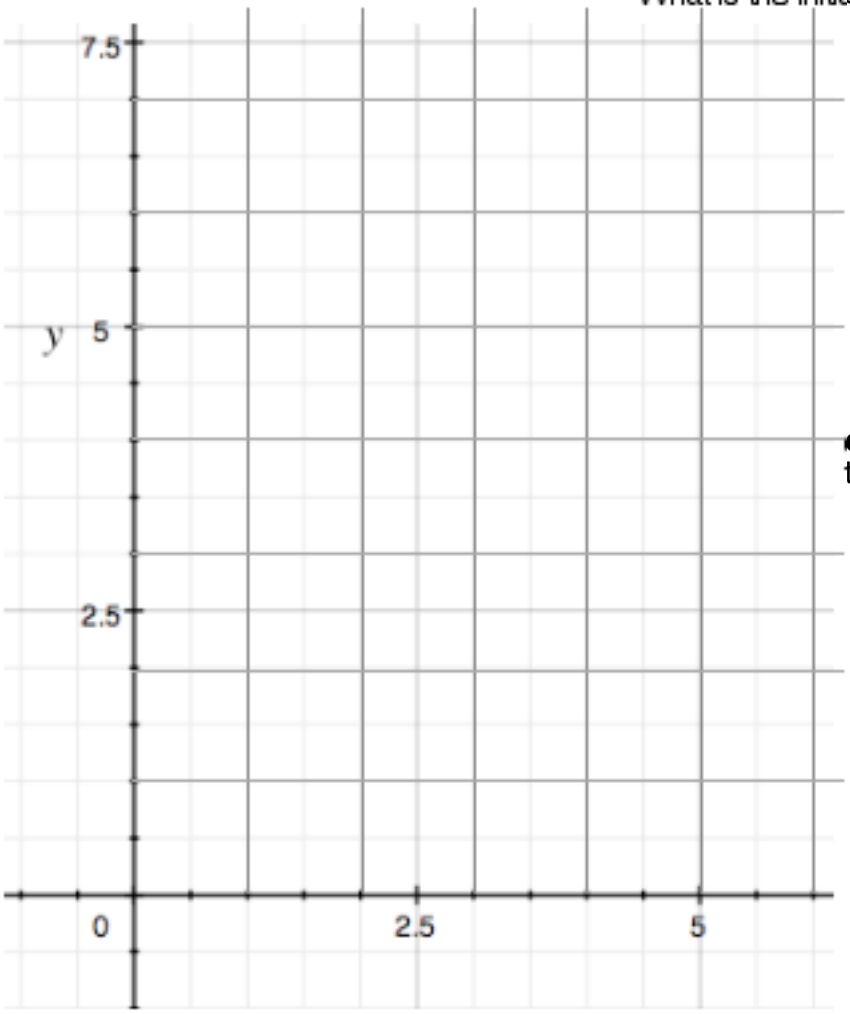
c) Sketch a graph of **distance versus time** for this object.

6. The **velocity** of an object over time is described by the equation $y = -3x + 6$ where y represents velocity in meters per second and x represents time in seconds.

a) Find the object's velocity at t = 1 seconds and at t = 2 seconds.

b) Sketch a graph of velocity versus time. What is the **acceleration** of the object?

What is the initial velocity of the object?



c) Where is the velocity positive?

Where is it negative?

d) Find an equation for the object's **distance** over time. Then sketch it on the same graph.

e) What does the positive area represent? What does the negative area represent?

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7. The **velocity** of an object over time is described by the equation $y = 8x^2 - 3x$, where y represents velocity in meters per second and x represents time in seconds.

a) Find the object's velocity at t = 2 seconds.

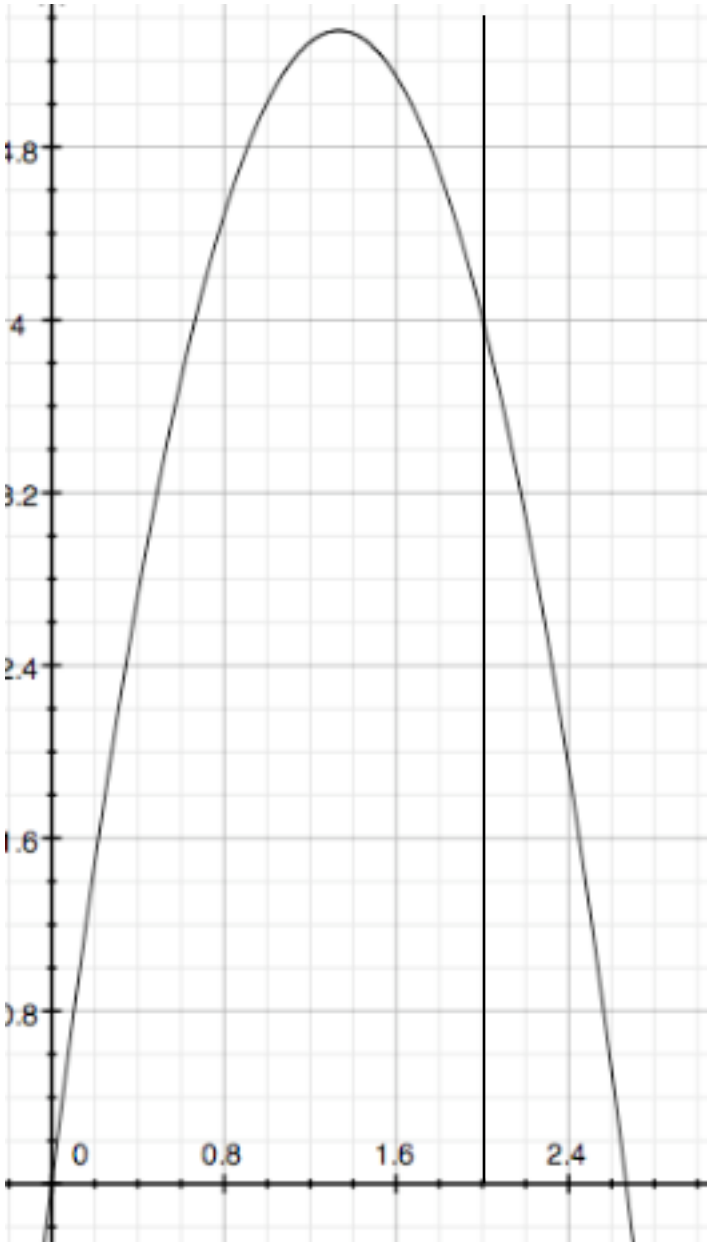
b) If the object kept going at that rate, how far would it have travelled between t = 2 seconds and t = 3 seconds?

c) Why does (b) **not** give the exact answer for how far the object has travelled?

d) If the object's velocity at t = 2 was imagined to be constant for at least .01 seconds, how far would we estimate that the object travelled between t = 2 and t = 2.01?

e) Does letter (d) give a good approximation of the actual distance travelled? Explain.

f) Label the graph below to show **geometrically** what you calculated in part (b) and in part (d).



g) When you calculate **displacement** using a velocity-time graph, what are you calculating geometrically?

h) Find an equation for the object's position over time.

i) Calculate the **exact** displacement between t = 2 and t = 3.

j) Calculate the exact displacement between t = 2 and t = 2.01 .