MAT 151 Quiz 10

Apr. 3, 2020

Use the following information for the next four questions. While burning, a candle 16 inches tall decreases by 2.0 inches per hour. The function $L(t)$ is the function that expresses the height of the candle in inches as a function of the number of hours the candle has burned.

1. [22F] Which type of functions (linear, quadratic or exponential) would you use to model this function $s(x)$?

2. [3L] Write the function of $L(t)$.

3. [1L] When the candle will be 15 inches tall?

4. [17F] Write a function equation, L^{-1} that expresses the time the candle has been burning as a function of the length of the candle in inches.

Let $q(x) = \dfrac{x^2+1}{x^2+x-2}$. Answer the next three questions.

5. [19F] Find all the vertical and horizontal asymptotes of $q(x)$.

6. [21F] On what intervals is $q(x)$ decreasing?

7. [20F] Solve the inequality $q(x) < 0$.

8. [26T] A park has a circular walking path with a radius 33 meters. If we choose a coordinate system so that the center of the walking path is at the $(-3, 2)$, write the equation of the circle.

9. 11E Rewrite the expression

$$-5\log(x)+\frac{2}{3}\log(y)+\frac{3}{2}\log(z)$$

that involves three log functions using one log function.

10. 10E Solve the equation $-1+2\log_{16}(x)=-5$.

11. 12E Fill in the blank:

$$\log_4(5)=\frac{\log_6(\quad)}{\log_6(\quad)}.$$

12. 23F Given a function $h(x)=x^2$ and $k(x)=-\frac{1}{2}(x+3)^2-2$. Describe how to get the graph of $k(x)$ from the graph of $h(x)$. Be very precise about the order of the transformation and the unit of each transformation.